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TRIBAL INTERESTS, INSTREAM FLOWS & HYDROPOWER LICENSING

USING THE LICENSING PROCESS TO ADDRESS TRIBAL CONCERNS

by Mason Morisset, Morisset, Schlosser, Jozwiak & Somerville (Seattle, WA)

INTRODUCTION

HYDROPOWER IMPACTS & LEGAL RECOURSE

Hydropower facilities have numerous impacts on water resources and especially on stream flows. The licensing and relicensing processes for these facilities rightfully include avenues to consider and address a range of such impacts.

Dam construction and operation will impact: water quality at the project; impoundment elevations of associated reservoirs; flow releases to the subject river for fish; channel conveyance capacity of the river, possible reduction of flooding on the river; restoration or maintenance of fish habitat in the river and its tributaries; water quality, fish, and habitat; downstream and upstream fish passage; fish supplementation; tailrace monitoring of fish migration delay, injury, and mortality; measures to protect and enhance federally listed threatened and endangered fish species; terrestrial habitat and wildlife protection; shoreline management and recreation enhancements; and managing cultural resources and historic properties.

Indian tribes are often adversely affected by these issues and the impact of a project on instream water flows. However, there are substantial legal tools available during the hydropower licensing process that tribes may utilize to protect their interests in maintaining appropriate instream flows. This article describes some of those tools.

FEDERAL ACTS & TRIBAL AUTHORITY

Several federal acts have bearing on hydropower licensing, as do the sovereign rights of the tribes.

Tribal Regulatory Authority

Indian tribes as sovereigns can exercise considerable regulatory control over certain aspects of reservations and particularly over water flowing through or adjacent to it. The Clean Water Act also provides that the United States is authorized to **t**reat Indian tribes **a**s a **s**tate (TAS) for purposes of applicable sections of the CWA. 33 U.S.C. § 1377(e). For tribes that qualify, this provision can provide substantial authority for the tribe to influence instream flows where a hydropower project will affect waters flowing through or adjacent to a reservation.

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Editors: David Light
David Moon

Phone: 541/ 343-8504
Cellular: 541/ 517-5608
Fax: 541/ 683-8279
email:
thewaterreport@yahoo.com
website:
www.TheWaterReport.com

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Federal Power Act Provisions

FPA Section 10(j) Recommendations

Section 10(j) of the Federal Power Act (FPA), 16 U.S.C. § 803(j)(1) (2006), requires the Federal Energy Regulatory Commission (FERC), when issuing a license, to include conditions based on recommendations by federal *and* state fish and wildlife agencies submitted pursuant to the Fish and Wildlife Coordination Act, 16 U.S.C. § 661 et seq. (2006) — "to adequately, and equitably protect, mitigate damages to, and enhance fish and wildlife (including related spawning grounds and habitat)" affected by the hydropower project (Project). Obviously, tribes that have natural resource interests can utilize these statutes to protect those interests.

FPA Section 18 Prescriptions

Section 18 of the FPA, 16 U.S.C. § 811 (2006), provides that FERC shall require the construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the US Secretary of the Interior or the US Secretary of Commerce, as appropriate.

FPA Section 4(e) Conditions

Section 4(e) of the FPA, 16 U.S.C. § 797(e) (2006), provides that FERC may issue a license for a Project located on a federal reservation only if it finds that the license will not interfere or be inconsistent with the purpose for which the reservation was created or acquired. Reservations are defined in section 3(2) of the FPA, 16 U.S.C. § 796(2) (2006), and include Indian reservations.

Clean Water Act Provisions

The federal Clean Water Act (CWA) provides that an applicant for a federal license or permit to conduct any activity (such as a hydropower facility), which may result in any discharge into the navigational waters of the US, shall provide the licensing or permitting agency (in this case FERC) a certification from the state in which the discharge originates. 33 U.S.C. § 1341 (FWPCA § 401). That certification will include compliance with: CWA § 1311 (Effluent Limitations); CWA § 1312 (Water Quality Related Effluent Limitations); CWA § 1313 (Water Quality Standards and Implementation); and CWA § 1317 (Toxic and Pre-treatment Effluent Standards). Obviously, compliance with these statutory provisions and applicable regulations can have a major impact on stream flows associated with the hydropower project.

As to CWA compliance, FERC has authority to take corrective action if a State fails to act to certify licensee compliance. In *Keating v. FERC*, 927 F.2d 616 (D.C. Cir. 1991), the applicant asked that FERC issue a license after the State of Washington withdrew a § 401 certification (33 U.S.C. § 1341 (FWPCA § 401)). That Court held that FERC must ascertain whether a valid certification exists before issuing a license. *Id*. at 624-25. The Court rejected FERC's insistence that it was "powerless" to do anything and that the licensee's only recourse was in State court. *Id*. at 620. Compliance with Washington State's water quality standards there would likely have resulted in mandatory flow-related conditions. *See Jefferson County PUD v. Ecology*, 511 U.S. 700 (1994).

CWA Section 401 does not authorize "certification:"

- by private settlement without public notice;
- that expires upon license issuance; or
- that omits the CWA's mandatory attestations. 40 C.F.R. § 121.2(a).

Obviously, a tribe can insist on CWA compliance to protect its interests.

Federal Endangered Species Act Provisions (16 U.S.C. § 1531-1544)

A hydropower project cannot impede stream flows in such a way as to "take" endangered species unless such taking is "incidental" to an "incidental take permit" provided by the relevant agency. The need for a licensee to comply with this statute and the requirements that may be set by the relevant regulatory agency (such as US Fish and Wildlife Service or NOAA Fisheries) should be obvious. The licensee may "take" protected species only pursuant to an "incidental take permit" as provided for in the statute. *See* 16 U.S.C. § 1539(a)(B).

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA), 16 U.S.C. § 1451 *et seq*, requires that applicants provide FERC with "certification" that the proposal "complies with the enforceable policies of the State's [coastal] program" and "will be conducted in a manner consistent with the program." 16 U.S.C. § 1456(c)(3)(A). The State has sixty days to notify FERC of concurrence with or objection to an applicant's certification, after which concurrence is conclusively presumed. *Id*. This process often results in state-issued mandatory license conditions.

However, FERC should refrain from issuing the license until a State: (1) affirmatively concurs in license certification; (2) timely objects; or (3) fails to act by timely objection. *Id*. Where the State timely acknowledged that a Project violated the state program but refused to take any action (Section 5.16), a Washington court of appeals invalidated such behavior as "arbitrary and capricious." *Skokomish v. Fitzsimmons*, 97 Wash. App. 84, 95, *rev. denied* 143 Wash. 2d 1018 (2000).

Tribes, Hydropower, & Instream Flows

Trust Assets Protection

Reservation Purpose

FPA § 4(e) Inclusion

Scope of Conditions

Mitigating Conditions

Tools in Action

Fish Passage

Monitoring

FERC LICENSING & TRIBAL RIGHTS

LEGAL CONSTRAINTS ON FERC LICENSING POWER WHERE TRIBES ARE AFFECTED

FERC's Trust Responsibility to Tribes

As is true of all federal agencies, FERC has a trust responsibility to protect tribal trust assets, which include treaty fishing and water rights and Reservation lands. *See United States v. Mitchell*, 463 U.S. 206 (1983); *Parravano v. Babbitt*, 70 F.3d 539, 546 (9th Cir. 1995). FERC must interpret the FPA "liberally in favor of the Indians, with ambiguous provisions interpreted to their benefit." *County of Oneida v. Oneida Indian Nation*, 470 U.S. 226, 247 (1985) (citations omitted).

Section 4(e) of the FPA directs FERC to issue a license "…within any reservation only after a finding by the Commission that the license will not interfere or be inconsistent with the purpose for which the reservation was created or acquired." 16 U.S.C. § 797(e). A Cabinet Secretary may determine license conditions that protect the resources of a reservation under the Secretary's jurisdiction. FERC "must include the Secretary's conditions in the license even if it disagrees with them." *Escondido Mut. Water Co. v. La Jolla Indians*, 466 U.S. 765, 772 (1984).

FERC Must Honor Interior Conditions Where Tribal Reservations Are Involved

CITY OF TACOMA V. FERC

In an important victory for tribes, the D.C. Circuit Court held in *City of Tacoma v. FERC*, 460 F.3d 53 (D.C. Cir. 2006) that FERC must include the Interior Department's § 4(e) conditions in any license it issues for a Project which was partially on an Indian reservation. *Id*. at 64-67. The Skokomish Tribe had proposed even more stringent protective conditions but was satisfied that the Interior Department's conditions would go far towards the goals of restoring the Skokomish River and fisheries resources. The federal court of appeals rejected FERC's argument that the Interior Secretary's § 4(e) conditions must be limited to the impacts of the Project facilities actually located on reservation lands — which were a transmission line and access road. That court concluded instead that since some Project facilities are located on reservation land, the Secretary may impose any license "conditions that are designed to mitigate the effect of the project on the Skokomish River to the extent doing so is reasonably related to protecting the reservation and the Tribe." *Id*. at 67. Relying on *Escondido Mut. Water Co. v. LaJolla Band of Mission Indians*, 466 U.S. 765 at 777-79 (1984), the court of appeals held that the FPA "gives FERC no discretion to reject Interior's § 4(e) conditions," (460 F.3d at 67). The court of appeals remanded the case for further proceedings, leaving open opportunities for: (1) FERC to "express its disagreement" with the conditions and seek to persuade Interior to modify them; (2) FERC to deny the license; and (3) the City to litigate the reasonableness of the conditions. *Id*.

FERC LICENSING & TRIBAL INSTREAM FLOW CONCERNS

TRIBES CAN UTILIZE LICENSE CONDITIONS TO PROTECT INSTREAM FLOWS

EXAMPLE: FERC PROJECT NO. 460 (CUSHMAN)

Utilizing the tools described above, tribes can insist on resource license additions involving instream flows to protect natural resources and tribal property, and address other issues. The following are some examples taken from a real case, FERC Project No. 460 (Cushman) 132 FERC ¶ 61,037 (July 15, 2010). The Cushman hydroelectric project is owned and operated the City of Tacoma, Washington.

Upstream Fish Passage

A licensee can be directed to provide safe, timely, and effective upstream fish passage at a Project for the term of the license. These terms can require the licensee to install, operate, maintain and monitor fish passage facilities at its own expense.

FISH PASSAGE FACILITIES MAY BE DESIGNED TO:

- protect and mitigate damages to fisheries
- provide access to historic spawning and rearing habitat
- enhance the restoration of fish to the river system

All of these kinds of provisions can have a significant effect on instream flows.

Fish Passage Monitoring Plans

A licensee can be required to implement Fish Passage Monitoring Plans.

FISH PASSAGE MONITORING PLANS CAN:

- measure fish survival through the reservoir, fishways, and transport mechanisms
- access compliance with survival and performance standards for effective passage
- inform the implementation of fish passage conditions

Tribes, Hydropower, & Instream Flows

ESA Plans

Instream Flows

Fish Supplementation Programs

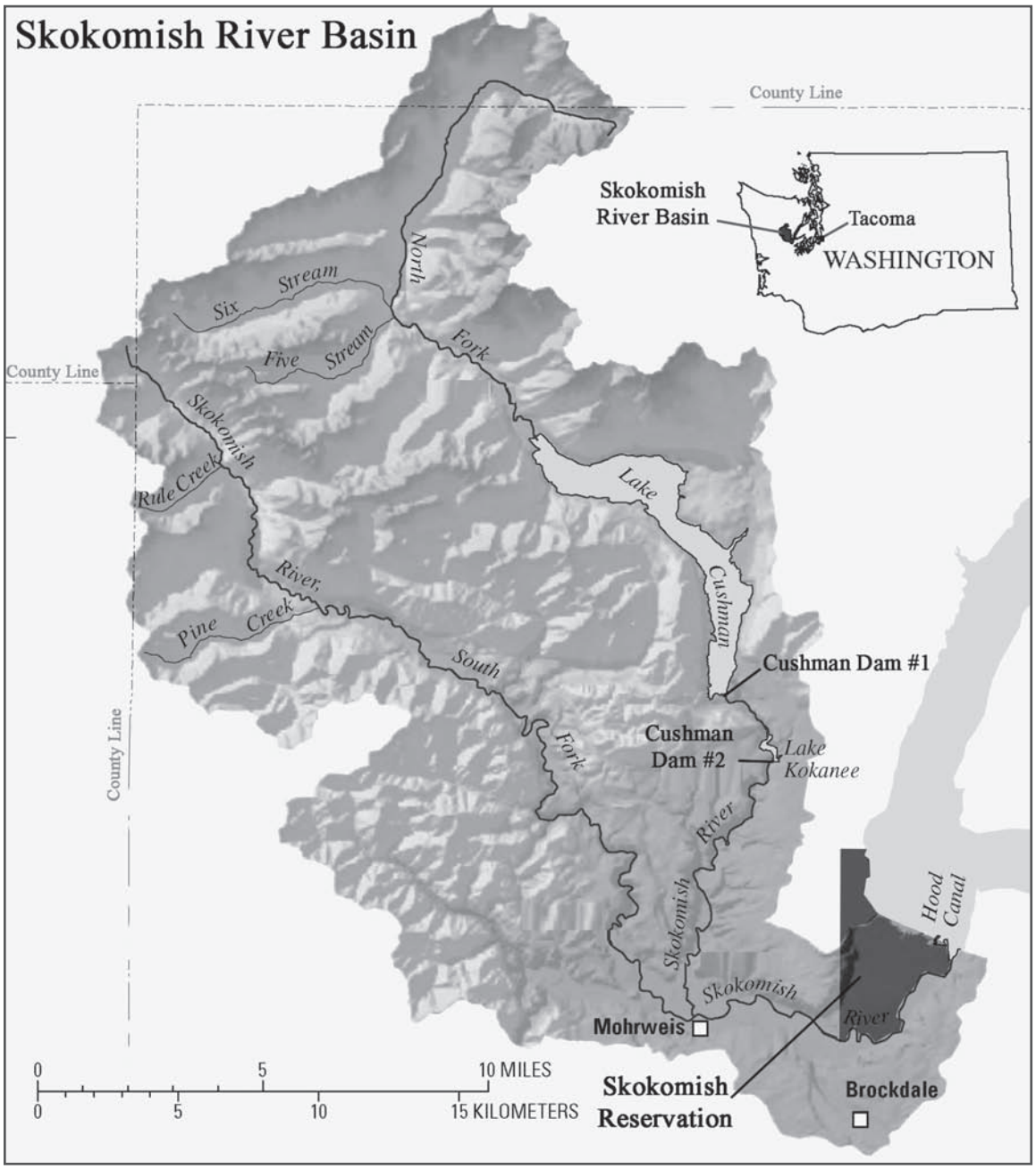
Licensees can be required to develop a plan to implement a fish supplementation program. The purposes of fish supplementation programs are to protect, address damages to, and enhance fisheries. The Fish supplementation program objectives include:

- supporting the reintroduction, restoration, and long-term maintenance of anadromous fish populations
- providing harvest opportunities to treaty Indian and non-treaty fishers
- providing recreational fishing opportunities

Threatened and Endangered Species Plans

A licensee can be required to develop a Threatened and Endangered Species Protection Plan (T&E Plan). The T&E Plan may include measures to protect such species as: salmon; steelhead; bull trout; peregrine falcon; bald eagle; marbled murrelet; and spotted owl. T&E Plan protections can apply during both project construction and project operation and include measures to protect critical habitat for these species.

The implications for instream flows are obvious, especially with regard to fish resources.



Tribes, Hydropower, & Instream Flows

Fisheries, Wildlife and Habitat Committee

A licensee can be required to establish and convene a Fisheries, Wildlife and Habitat Committee (FWHC) for the purpose of consultation with the licensee on fisheries. This committee can include the affected tribe as an active member. The licensee can be required to obtain the views of — and attempt to reach consensus among — the specified parties or specified committee whenever the license requires the licensee to consult.

Minimum Flows

FERC can require a licensee to release flows from a Project, in accordance with all components of a flow regime required by the license.

Minimum Flow Purposes

The purposes of minimum flow license conditions can include:

- protecting, mitigating, and enhancing fish and wildlife resources, riparian vegetation, aesthetic resources, and water quality
- providing safe, timely, and effective fish passage
- improving sediment transport

Flow regimes can include several components, such as the following examples from the Cushman Dam Project's license.

License Flow Particulars

Article 407 of the license requires the licensee to release a minimum flow of 240 **c**ubic **f**eet per **s**econd (cfs) or inflow to the Project, whichever is less, for the protection and enhancement of fish and wildlife resources, riparian vegetation, aesthetic resources, and water quality in the river downstream of the dam. Article 407 accommodates these objectives while also addressing fish migration, channel formation, and sediment transport in the mainstem. Sediment transport also supports several objectives identified in proposed Article 403 to reduce the human health and welfare risks of flooding.

Water Budget

To achieve these goals, Article 407 uses a water budget of 160,000 acre-feet to support a flow regime designed to mimic the timing, duration, and frequency of annual flow events. Article 407 sets a predetermined minimum flow schedule, based on 115,835 acre-feet of storage in the main reservoir, to establish and maintain habitat improvements in the river. In addition, the annual variable flow from 44,165 acre-feet of storage will be released to address juvenile and adult fish migrations through the mainstem and lower rivers. Finally, channel formation and sediment transport flows, in addition to those provided based on storage, will be released as seasonal conditions dictate.

Review & Adaptation

Additional channel formation and sediment transport flows will be subject to adaptive management over the term of the license. For instance, beginning in year five of the license and every five years thereafter, the Fisheries and Habitat Committee will evaluate the effectiveness of the flows and recommend any necessary modifications to the flow trigger, timing, and duration. If the Committee determines that these flows are not effective at improving mainstem sediment transport, it may request that the licensee cease these flows and develop and implement a Flood Damage Reduction and Mitigation Plan (Flood Mitigation Plan).

Flood Mitigation

The flood mitigation plan would:

(l) outline the rationale for ending the channel forming and sediment transport flows;
(2) identify an initial list of projects that the Licensee would implement;
(3) include provisions for establishing a Flood Damage reduction and Mitigation Fund; and
(4) include provisions for resuming the flows, if determined appropriate.

Projects implemented in areas that are both outside the river sub-basin, and outside the then-existing project boundary, will be onetime actions that would not result in the expansion of the project boundary.

Variable Approach

The variable approach to flow management is more closely tied to resource needs, and will ensure a greater level of protection to the resources than would be afforded by a single minimum flow. Such an approach will allow resource managers and the Tribe to assess the flow needs for fish each year and adjust accordingly. License conditions can address the possibility that the parties may not reach agreement on flow changes by establishing a default flow regime. Finally, the long-term effects of the channel-forming and sediment-transport flows are expected to improve channel conveyance capacity, thus reducing the potential for flooding over time.

Requiring a Water Quality Enhancement Plan

A licensee can be required to develop and implement a Water Quality Enhancement Plan.

Water Quality Actions

Water quality enhancement plans can include provisions for:

(1) installing emergency intake shutoff valves on all penstock intakes;
(2) improving and maintaining access roads to protect water quality; and
(3) monitoring dissolved gases at all powerhouse outfalls and spillways, including mechanisms, data recording methods, a schedule, and reasonable enhancement measures if needed to maintain state water quality standards.

The license conditions can require that the plan be developed in consultation with numerous federal and state agencies as well as the affected tribe.

Tribes, Hydropower, & Instream Flows

Flow Release Monitoring

Effective Relicensing Tools

Ramping Rate Conditions

A license can require the Licensee to develop a plan to implement and maintain ramping rates for flow releases from the project designed to protect tribal interests. A licensee may be required to monitor channel morphology and substrate composition in the river to document the effects of a flow regime prescribed license conditions.

Ramping rate flow release monitoring can determine:

(1) the magnitude of flows that initiate transport of spawning-sized gravel in the river;
(2) the extent to which high flow releases result in changes in substrate composition and changes in channel cross sections in the river; and
(3) the extent to which high flow releases result in changes in channel cross sections and channel aggradation in the river.

CONCLUSION

These real life examples illustrate how a tribe affected by a hydropower facility can have a major impact on hydropower licensing during the relicensing process. Conditions that accompany the license are obviously critical to lessen the affects on tribes and establish management provisions going forward that address important aspects of habitat and instream flows.

For Additional Information:

Mason Morisset, Morisset, Schlosser, Jozwiak & Somerville,
206/ 386-5200 or m.morisset@msaj.com

Mason Morisset is the senior member of the law firm of Morisset, Schlosser, Jozwiak & Somerville, in Seattle, Washington. He received his Bachelor's Degree from Lewis & Clark College, Portland, Oregon, an M.A. in Political Science from the University of Washington, and his J.D. from the University of California at Berkeley. He has been an active litigator for over 42 years primarily in the area of natural resource litigation. He has argued numerous appellate cases and has successfully argued three cases to the US Supreme Court: *Antoine v. Washington*, 420 U.S. 194 (1975) (treaty hunting rights); *Washington v. Fishing Vessel Association*, 443 U.S. 658 (1979) (the "Boldt" fishing rights decision); and *Arizona v. California*, 530 U.S. 392 (2000) (Quechan Tribe water rights on the Colorado River). He has argued to the Washington State Supreme Court and before the California State Court of Appeals on behalf of Indian Tribal water rights. Mason is the author of the WSBA Real Property Deskbook chapter on Indian Property Rights and several law review articles.

Mason Morisset will be speaking on "Tribal Participation in Hydropower Projects" at the **Tribal Water Law Conference** being held **October 27 & 28** in **Las Vegas.**

Floodplain Insurance & ESA

NATIONAL FLOOD INSURANCE & THE ENDANGERED SPECIES ACT

NATIONAL FLOOD INSURANCE IN A POST-JEOPARDY ENVIRONMENT

FEMA'S "REASONABLE AND PRUDENT ALTERNATIVE" IMPLEMENTION FOR THE PUGET SOUND BIOLOGICAL OPINION

by Mark G. Eberlein, Federal Emergency Management Agency Region 10 (Bothell, WA, Office)

BACKGROUND

National Flood Insurance Program (NFIP)

NFIP

The US Congress established the National Flood Insurance Program (NFIP) with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the Federal Government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the Federal Government will make flood insurance available within the community as a financial protection against flood losses. This insurance is designed to provide an insurance alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods.

From: National Flood Insurance Program Description
FEMA, 2002, See: www.fema.gov/library/viewRecord.do?id=1480

ESA "Failure to Consult"

In 2003, the citizens group "National Wildlife Federation" sued the US Department of Homeland Security's Federal Emergency Management Agency (FEMA) for failure to consult under the federal Endangered Species Act (ESA) in regards to its administration of the National Flood Insurance Program (NFIP). *National Wildlife Federation v. FEMA*, 345 F. Supp. 1151, 1154-55 (W.D. Wash. 2004). On November 17, 2004, the judge agreed with the plaintiffs and required FEMA to consult with the National Marine Fisheries Service on NFIP impacts to salmon. In response, FEMA Region 10 complied by submitting a *"National Flood Insurance Program (NFIP): Programmatic Biological Evaluation for Listed Anadromous Salmonids in Washington State"* (Biological Evaluation) to the National Marine Fisheries Service's (NMFS') Washington State Habitat Office on February 14, 2006. Biological Evaluation available at: www.fema.gov/pdf/about/regions/regionx/2006_WA_Programmatic_Biological_Opinion.pdf.

FEMA Evaluation

FEMA's Biological Evaluation concluded that NFIP affected salmon, but not adversely. The reason for this determination was driven, in large part, by the way NFIP in Washington State interacts with, and is often overshadowed by, more stringent regulations on floodplain use at the County or City level. For any specific development in the floodplain, there can be a potential mix of adverse and beneficial effects to listed salmonids. On a program level, FEMA Region 10 concluded that the implementation of NFIP, along with proposed Conservation Measures enumerated in the Biological Evaluation, made it difficult to appreciably measure NFIP's contribution to this indirect effect among the State and local land use regulatory framework. The Biological Evaluation thus concluded that "NFIP in Washington State *May Affect, but is Not Likely to Adversely Affect* listed salmon, steelhead, and their Critical Habitat." Biological Evaluation, p. ES-5, emphasis in original

NMFS BiOp

Subsequently, in September 2008, NMFS Northwest Region provided a Biological Opinion (BiOp) which concluded that NFIP, as currently implemented, did cause "jeopardy" to salmon and "adversely modified" their "critical habitat." BiOp available at: https://pcts.nmfs.noaa.gov/pls/pcts-pub/pcts_upload.summary_list_biop?p_id=29082); RE: "jeopardy" and "adverse modification" of critical habitat *see:* 16 U.S.C. §1536 (b)(3)(A).

Floodplain Habitat

NMFS' BiOp concluded that "FEMA's activities do lead to floodplain development in Washington State, some of which affects the habitat of listed species." (BiOp, p. 3, 2008). NMFS determined that salmon populations of the most critical Evolutionary Significant Units were falling below sustainable levels owing, in part, to poor or significantly reduced available floodplain/natural channel habitat. It further concluded that NFIP's on-going actions would "continue to decrease high quality floodplain and channel habitat, further degrading conservation value of critical habitat and limiting the value of recovery actions."

FEMA Region 10 then collaborated with NMFS in formulating alternatives that would reduce the adverse effects and avoid jeopardy or adverse modification of critical habitat. At the end of this consultation, NMFS provided a "Reasonable and Prudent Alternative" that is comprised of seven Elements.

Floodplain Insurance & ESA

RPA Elements

NMFS' reasonable and prudent alternative for nfip includes:

Element 1 — Notification: FEMA must notify participating communities (i.e., a community for which the Flood Insurance Administrator has authorized the sale of flood insurance, 44 C.F.R. §59.1, Definitions) about the requirements of the BiOp.

Element 2 — Mapping requirements: FEMA must evaluate impacts prior to changing maps; prioritizing map changes based upon species recovery priorities' and addressing future conditions.

Element 3 — Addressing adverse effects: FEMA must evaluate and prohibit or mitigating adverse effects to species/habitat on any development occurring in the floodplain.

Element 4 — Community rating system changes: FEMA's Community Rating System (CRS) provides reduced insurance premiums to communities that adopt floodplain management ordinances that exceed NFIP minimum requirements. This Element lists changes to the CRS for promoting the conservation of the species/habitat.

Element 5 — Levee criteria: This Element addresses levee criteria for recognition on the flood maps.

Element 6 — Mitigation: This Element requires mitigation for any adverse impacts to species/habitat.

Element 7 — Reporting and monitoring: This Element describes reporting and monitoring requirements for evaluating the effectiveness of the Alternative.

This article will focus on the Alternative's Elements 2 and 3 — the two primary elements affecting FEMA and the participating communities.

REASONABLE and PRUDENT ALTERNATIVE ELEMENT 2: MAPPING

Species & Habitat

"Floodway"

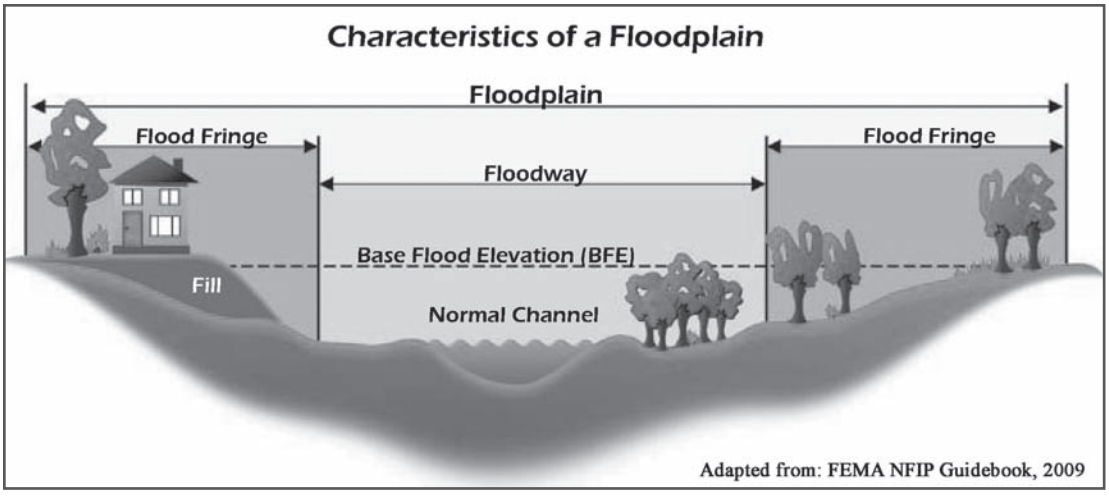
Local Permits

FEMA Regulations

The Reasonable and Prudent Alternative Element 2 required FEMA to modify mapping methodology to better account for species and habitat. Part of mapping involves the review and issuance of Conditional Letters of Map Change (CLOMCs). Issued before a physical action occurs in the floodplain, CLOMCs are FEMA's comments as to whether a proposed project would meet minimum NFIP requirements and how the proposed changes would impact NFIP maps. Since these actions are "proposed," FEMA has the ability to evaluate and comment on the proposal, and any associated impacts, prior to the construction. Conditional Letters of Map Revision (CLOMR) are a type of CLOMCs. The issuance of a CLOMR is not an approval to proceed with construction, but a comment about the proposal and its impacts on the **b**ase **f**lood **e**levation (BFE) or "floodway." The base flood, sometimes referred to as the hundred -year flood, is an estimation of the largest flood expected to occur within a hundred-year period. The floodway includes the channel of a river or stream and the overbank areas adjacent to the channel. The floodway carries the bulk of the floodwater downstream and is usually the area where floodwater velocities and forces are the greatest and most destructive. (*See* Anderson, *TWR* #91 for previous discussion on this aspect of NFIP).

The approval to proceed is associated with the local community's floodplain permit(s). A community may choose to require a CLOMR for all permits, but this is often unnecessary given the typical project proposal that does not impact the BFE (e.g., additions to existing structures, repairs and upgrades to existing facilities, etc.). However, for large development projects involving fill or grading, a CLOMR may provide some level of assurance to a community. A CLOMR can indicate that FEMA will not find the project proposal out of compliance with the minimum requirements of NFIP — provided the project is being constructed as approved by the CLOMR.

FEMA regulations require a CLOMR in some instances, such as: when a proposed project will cause more than a one-foot rise in the BFE when no floodway is present; and when a proposed project will cause any rise in the BFE when a floodway is present (44 C.F.R. §§ 65.6 and 65.12). Participating communities,



Floodplain Insurance & ESA

Impact Analysis

Section 7 Consultation

or an individual through a community, may also request a CLOMR for a proposed action to determine the need for a map revision (44 C.F.R. §65.8).

The process for obtaining a CLOMR is outlined under Procedure Memo 64, located on FEMA's website: www.fema.gov/library/viewRecord.do?id=4312. Two forms are used for gathering all necessary data. Both the MT-1 and MT-2 form have instructions for completing the form. Each applicant will be required to document how the proposed action complies with the Endangered Species Act. Procedure Memo 64 provides additional information on the necessary documentation to demonstrate compliance.

Upon submittal of the documentation with the CLOMR packet, FEMA evaluates the information and determines the accuracy of the impact analysis on the concerned species and species' habitat. If the provided information sufficiently describes the action, the impacts, and offers appropriate mitigation, then FEMA will act upon that information. If the documentation includes another federal agency's analysis and documentation of compliance with ESA — typically ESA Section 7 consultation documents from NMFS or the US Fish & Wildlife Service (USFWS) — then FEMA will accept such documentation and process the CLOMR as compliant with ESA. The same applies for any projects that are covered under a Habitat Conservation Plan issued as a Section 10 permit (16 U.S.C. §1539(a)(1)(B)) (Permits) or an activity approved by NMFS under Section 4d of the ESA (16 U.S.C. §1533(d)) (protective regulations).

If an applicant is unable to show that the proposed action falls within another federal agency's authority or under an approved Section 10 permit, then FEMA will consider whether to proceed with its own Section 7 consultation on the proposed action. FEMA is not obligated to proceed with a Section 7 consultation on any requested CLOMR. In deciding whether to engage in Section 7 consultation for the application, FEMA will consider: the effect, or lack of effect, on resources; availability of sufficient resources to conduct the consultation; the applicant's capacity and resources to act as FEMA's non-Federal representative; and the stage of the project. If FEMA chooses not to act under Section 7, an applicant will need to pursue and obtain a Section 10 permit with the Services (NMFS and/or USFWS) before FEMA will process the CLOMR.

FEMA NFIP & ESA-Related Terms

Adverse effects: Effects that are a direct or indirect result of the proposed action or its interrelated or interdependent actions and the effect is not discountable, insignificant or beneficial. Discountable effects are extremely unlikely to occur. Insignificant effects relate to the size of the impact and should never reach the scale where a take occurs. Based on best judgment, a person would not: 1) be able to meaningfully measure, detect, or evaluate insignificant effects; or 2) expect discountable effects to occur. Beneficial effects are contemporaneous positive effects without any adverse effects. In the event that the overall effect of the proposed action is beneficial, but is also likely to cause some adverse effects, then the proposed action is considered to result in an adverse effect.

Base Flood: The flood having a one percent chance of being equaled or exceeded in any given year (also referred to as the "100-year flood"). The area subject to the base flood is the Special Flood Hazard Area as designated on Flood Insurance Rate Maps.

Base Flood Elevation (BFE): the elevation of the base flood above the datum of the effective FIRM.

Channel Migration Area: Area within the lateral extent of likely stream channel movement due to stream bank destabilization and erosion, rapid stream incision, aggradations, avulsions, and shifts in location of stream channels.

Community Rating System (CRS): The CRS provides reduced National Flood Insurance Program (NFIP) insurance premiums to communities that adopt floodplain management ordinances that exceed NFIP minimum requirements or undertake other floodplain management activities to reduce flood damages. Reductions in insurance premiums are based on the extent to which communities exceed the minimum requirements.

Flood Insurance Rate Map (FIRM): The official map on which the Federal Emergency Management Agency has delineated both the Special Flood Hazard Areas and the risk premium zones applicable to a community.

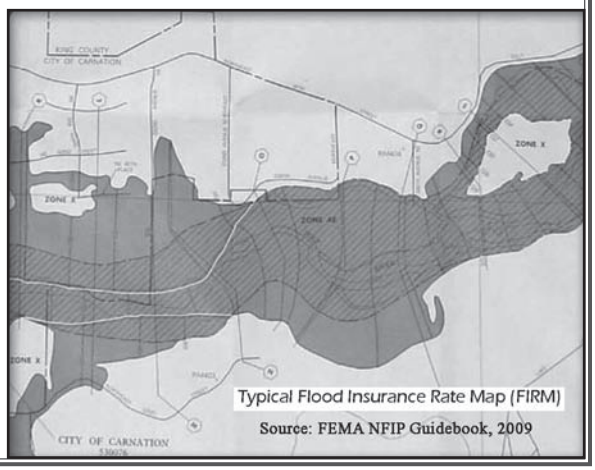
Mitigation: Actions taken to reduce or eliminate the risk of a hazard such as flooding; mitigation actions attempt to prevent flood hazards from developing into disasters, or to reduce the effects of flooding when it occurs.

Protected Area: Lands that lie within the boundaries of the floodway, the riparian habitat zone, and the channel migration area. Because of the impact that development can have on flood heights and velocities and habitat, special rules apply in the Protected Area.

Regulatory Floodplain: Area of the Special Flood Hazard Area plus the Protected Area.

Special Flood Hazard Area (SFHA): Floodplain identified on the flood insurance maps to represent the area that would be inundated by the Base Flood.

Adapted from definitions presented at the "Demystifying NFIP Alignment with the ESA" conference presented by FEMA, et al., March 2011

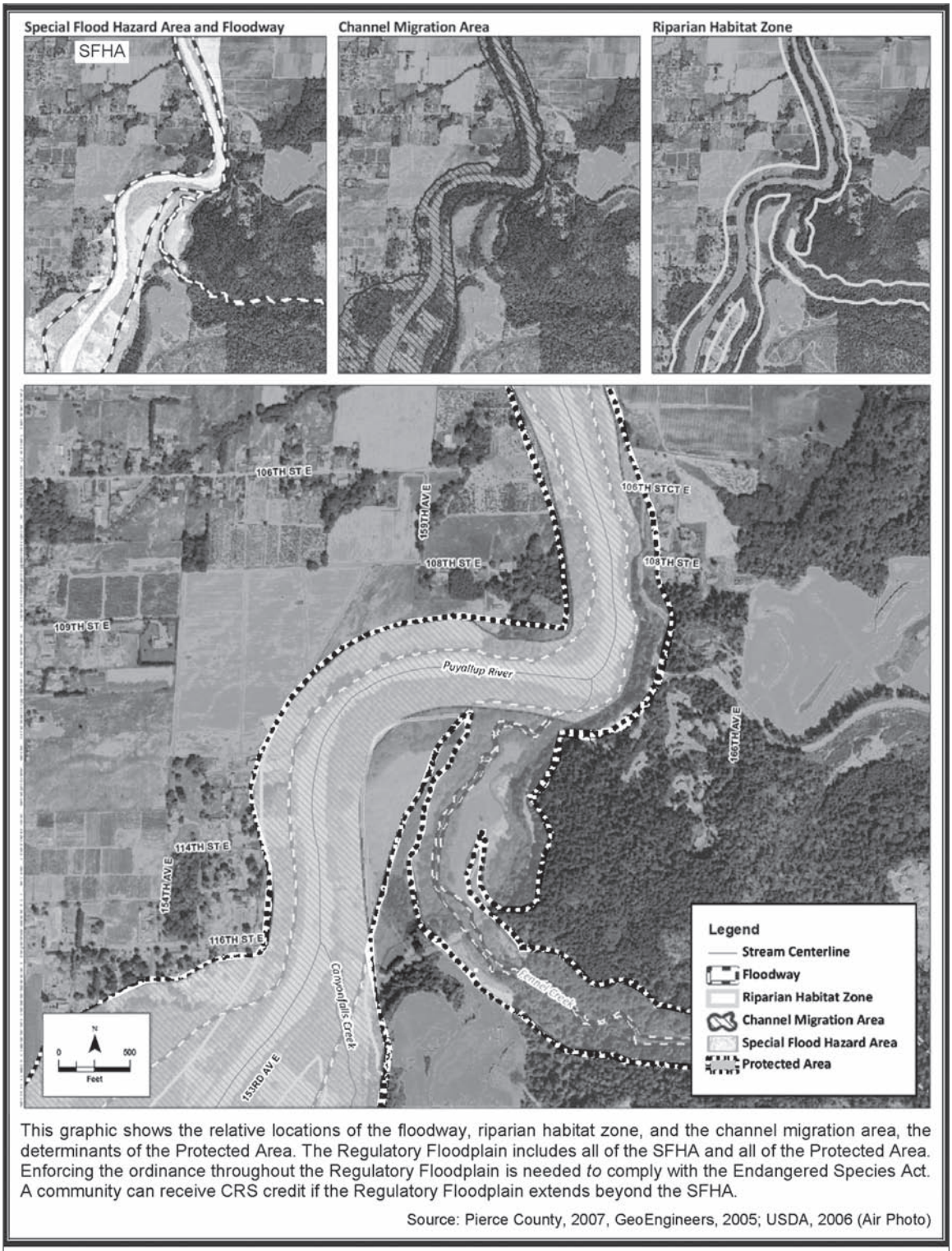


Typical Flood Insurance Rate Map (FIRM)
Source: FEMA NFIP Guidebook, 2009

Floodplain Insurance & ESA

Map Revisions

In regard to Letters of Map Revisions (LOMRs), FEMA considers them as actions with outcomes that it lacks the ability to influence: i.e., actions that have already taken place. Therefore, any changes to a floodplain resulting in a change in the floodplain mapping will not be evaluated for ESA compliance under the FEMA mapping program. However, any LOMR must have an associated local floodplain permit. It is through the local permit that these completed actions are expected to be evaluated for compliance with ESA prior to construction. Any LOMR issued without demonstrating ESA compliance will be referred by the FEMA Map Service Center to the FEMA Regional office for appropriate follow-up with the applicable participating community. [RE: FEMA Map Service Center, *see* http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1]



This graphic shows the relative locations of the floodway, riparian habitat zone, and the channel migration area, the determinants of the Protected Area. The Regulatory Floodplain includes all of the SFHA and all of the Protected Area. Enforcing the ordinance throughout the Regulatory Floodplain is needed *to* comply with the Endangered Species Act. A community can receive CRS credit if the Regulatory Floodplain extends beyond the SFHA.

Source: Pierce County, 2007, GeoEngineers, 2005; USDA, 2006 (Air Photo)

Adapted from Floodplain Habitat Assessment and Mitigation, FEMA Draft Guidance, 2011

Floodplain Insurance & ESA

Local Administration

Salmonid Protection

As concerns follow-up, FEMA Region 10 routinely conducts technical assistance visits with participating communities to ensure they are properly administering their floodplain program in accordance with the minimum requirements outlined in 44 CFR Part 60. If violations or discrepancies are determined, the FEMA Region 10 specialist works with the local official on corrective actions they can take, such as voluntary compliance, administrative steps, or legal recourses. (See *Study Guide and Desk Reference for Local Officials*, Unit 7 at: www.fema.gov/pdf/floodplain/nfip_sg_unit_7.pdf).

REASONABLE AND PRUDENT ALTERNATIVE ELEMENT 3: REGULATIONS

NMFS requires FEMA Region 10 to revise implementation of NFIP by requiring participating communities to "demonstrate to FEMA that any proposed development in the FEMA designated floodway, the Channel Migration Zone (CMZ) plus 50 feet (as identified according to Ecology [Washington State Department of Ecology] 2003) and the **r**iparian **b**uffer **z**one (RBZ, as described by the [Washington State] Department of Natural Resources 2007 stream typing system and WDFW's [Washington State Department of Fish and Wildlife's] 1997 stream buffer guidelines) does not adversely affect water quality, water quantity, flood volumes, flood velocities, spawning substrate, and/or floodplain refugia for listed salmonid." Additionally, "If development within the 100-year floodplain but outside the RBZ, is permitted, any loss of floodplain storage shall be avoided, rectified or compensated for." (NMFS BiOp, p. 154, 2008).

Endangered Species Act Terms

Biological Assessment: A document prepared for the ESA section 7 process to determine whether a proposed major construction activity under the authority of a Federal action agency is likely to adversely affect listed species, proposed species, or designated critical habitat.

Biological Opinion (BiOp): A document stating the opinion of USFWS or NMFS (NOAA Fisheries) on whether or not a Federal action is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat.

Critical Habitat: Specific geographic areas, whether occupied by a listed species or not, that are essential for its conservation and that have been formally designated by rule published in the Federal Register.

Evolutionary Significant Unit (ESU): A species stock that is substantially reproductively isolated from other stocks of the same species and which represents an important part of the evolutionary legacy of the species. Life history, ecological, genetic, and other information can be used to determine whether a stock meets these two criteria. NOAA Fisheries uses this designation.

Habitat Conservation Plan (HCP): A plan that outlines ways of maintaining, enhancing, and protecting a given habitat type needed to protect species; usually includes measures to minimize impacts, and may include provisions for permanently protecting land, restoring habitat, and relocating plants or animals to another area. Required before an incidental take permit may be issued.

Incidental Take: The "take" (see below) of an ESA-listed species member that results from, but is not the purpose of, carrying out an otherwise lawful activity.

Jeopardy: To engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species.

Listing: The formal process through which USFWS or NMFS adds species to the Federal list of endangered and threatened wildlife and plants.

Reasonable and Prudent Alternative (RPA): A recommended alternative action identified during formal consultation that can be implemented in a manner consistent with the intended purpose of the action, that can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, that is economically and technologically feasible, and that USFWS or NMFS believes would not jeopardize the continued existence of listed species or the destruction or adverse modification of designated critical habitat.

Section 4: Part of the ESA that addresses the listing and recovery of species and designation of critical habitat.

Section 4(d) rule: A regulation developed by USFWS or NMFS establishing prohibitions that apply for a threatened species. Any prohibitions adopted must be those necessary and advisable to provide for the conservation of the species. Before 2000, NMFS simply adopted 4(d) rules that prohibited take of threatened species. In a salmon and steelhead 4(d) rule signed in July of 2000, NMFS pioneered a new approach. It applied take prohibitions to all actions except those within 13 "limits" to the rules (described in detail in the rules) where the specified categories of activities contribute to conserving listed salmon. A separate but closely related tribal 4(d) rule created an additional limit for tribal resource management plans.

Section 7: Part of the ESA that requires all Federal agencies, in consultation with USFWS or NMFS, to use their authorities to further the purpose of the ESA and to ensure that their actions are not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat.

Section 10: Part of the ESA that lays out the guidelines under which a permit may be issued to authorize prohibited activities, such as take of endangered or threatened species.

Section 10(a)(1)(A): Portion of section 10 that allows for permits for the taking of threatened or endangered species for scientific purposes or for purposes of enhancement of propagation or survival.

Section 10(a)(1)(B): Portion of section 10 that allows for permits for incidental taking (see above) of threatened or endangered species.

Species: For purposes of ESA, this term includes any species or subspecies of fish or wildlife or plants, and any distinct population segment of any species of vertebrate fish or wildlife which interbreeds when mature.

- **Endangered Species**: An animal or plant species in danger of extinction throughout all or a significant portion of its range.
- **Proposed Species**: A species of animal or plant that is proposed in the Federal Register to be listed under section 4 of the Endangered Species Act.
- **Species of Concern:** An informal term referring to a species that might be in need of conservation action.
- **Threatened Species**: An animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Take: To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct; may include significant habitat modification or degradation if it kills or injures wildlife by significantly impairing essential behavioral patterns including breeding, feeding, or sheltering.

Adapted From: *Endangered Species Glossary*, USFWS, April 2005
See: www.fws.gov/endangered/esa-library/pdf/glossary.pdf

NMFS ESA Purview: NMFS is primarily responsible for marine species and anadromous (ocean-going, freshwater breeding) species.
USFWS ESA Purview: USFWS has primary responsibility for terrestrial and freshwater organisms

Floodplain Insurance & ESA

FEMA regulations under 44 C.F.R. § 60.3(a)(2) state that participating communities shall "review proposed development to assure that all necessary permits have been received from those governmental agencies from which approval is required by Federal or State law… ." The regulation also includes as an example the US Army Corps of Engineers (USACE) Section 404 permit. This inclusion of the USACE permit is not all-inclusive, but is just an example of a federal permit. As a result of the lawsuit cited above, FEMA reviewed the language in the regulation and researched background documents on the development of this paragraph in the regulation. FEMA then evaluated its internal guidance documents for monitoring compliance with the program.

Permit Approvals

Incidental Take

The intent of 44 C.F.R. §60.3(a)(2) is to ensure that all necessary Federal agency permits, which require prior approval, are obtained before issuance of the floodplain development permit. If the potential for the "take" of an ESA-listed species exists for an action, then the action entity — regardless of whether they are private entities such as individuals or corporations, or public entities (local, State and Federal governments) — is prohibited from undertaking that action without first coordinating with the appropriate federal Service. However, ESA authorizes USFWS and NMFS to issue a permit for "incidental take" should it be appropriately requested. Development and approval of a Habitat Conservation Plan is the typical mechanism for requesting an ESA Section 10 incidental take permit (*see* www.fws.gov/endangered/what-we-do/hcp-overview.html). Therefore, if the potential for "take" exists for a proposed development permit, the community has a requirement under 44 C.F.R. §60.3(a)(2) to ensure the ESA incidental take permit has been obtained. FEMA also considers any Incidental Take Statement, issued to federal agencies under Section 7 of the ESA, to meet the requirement and intent of 44 C.F.R. §60.3(a)(2).

Guidance

After discovering that Pacific Northwest participating communities have not applied this regulation provision as thoroughly as was intended, FEMA Region 10 developed guidance documents to assist them. These documents can be found on the FEMA website at www.fema.gov/regionx/nfipesa. They include a programmatic approach to integrating ESA compliance into the community's floodplain program and several guidance documents.

Since NMFS issued specific criteria for implementing NFIP so that jeopardy to ESA-listed species can be avoided, FEMA Region 10 expects participating communities to account for those criteria when evaluating their floodplain management programs.

Community Compliance

FEMA Region 10 suggests three options for community esa compliance:

1) Model ordinance adoption: Adopt a model ordinance that FEMA Region 10 developed with NMFS concurrence.
2) Sufficient existing regulation: Demonstrate to FEMA Region 10 how a community's existing regulations, programs, and requirements associated with issuance of floodplain development permits conforms to the requirements outlined in the Reasonable and Prudent Alternative of the Biological Opinion issued by NMFS.
3) Demonstrate permit applicant's esa compliance: Require that each permit application demonstrate compliance with ESA (either by securing a Section 10 permit, Section 7 Incidental Take Statement, Section 7 concurrence letter, determination of no effect by a federal agency, or conformance with Section 4(d) of the ESA).

"Take" Potential

Should an applicant (or non-federal entity) state that the potential for "take" does not exist, then the community must review and concur with that determination based upon the criteria laid out by the Reasonable and Prudent Alternative. This is to ensure that no ESA-related federal permit is required. The Reasonable and Prudent Alternative describes requirements to avoid "take" and provides a guideline participating communities can use to gage whether the potential for take exists.

For participating communities trying to implement this requirement of the RPA, it has been a difficult and confusing process. For example, one of the more frequent and significant challenges for participating communities has been figuring out how to address development that has the potential to adversely affect salmon habitat. NMFS' BiOp does not currently allow for any adverse effects to areas near waterways. Under the 2009 errata to the BiOp, the avoidance of adversely affecting near waterways is defined.

Adverse Affect Avoidance

Avoidance of adverse affect entails the greater of the following:

(1) "250 feet measured perpendicularly from the ordinary high water for Type S (Shorelines of the State) streams, 200 feet for Type F streams (fish bearing greater than 5 feet wide and marine shorelines), and 150 feet for Type F stream less than 5 feet wide" (and) "for lakes." "For type N (nonsalmonid-bearing) perennial and seasonal streams a 150 foot to 225 foot buffer applies, depending on slope stability (the 225 foot buffer applies to unstable slopes)."
(2) "The Channel Migration Zone plus 50 feet."
(3) "The mapped Floodway."

See https://pcts.nmfs.noaa.gov/pls/pcts-pub/pcts_upload.summary_list_biop?p_id=29082

Floodplain Insurance & ESA

"Affect" Guidance

Habitat Assessments

Compliance & Monitoring Changes

"Adverse affect" is not defined in ESA statutes or implementing regulations. However, USFWS and NMFS do define "affect" in their handbook as "to bring about change." (*Consultation Handbook*, Glossary of Terms, p. x, 1998 found at: www.fws.gov/endangered/esa-library/pdf/esa_section7_handbook.pdf). For this reason, along with others, FEMA Region 10 drafted a guidance document to identify and assess impacts to species and habitat. It follows a similar format utilized by federal agencies under ESA Section 7. Since most communities and individuals are familiar with US Army Corps of Engineers (USACE) permits, they will find many similarities between the information requested in the guidance document and what USACE requires for Clean Water Act permits. The intent is to utilize existing informational requests with which most practitioners would be familiar. The guidance document can be found on FEMA Region 10's website at: www.fema.gov/about/regions/regionx/nfipesa.shtm (*Habitat Assessment Guide DRAFT April 2011*).

In working with the participating communities, FEMA Region 10 realized that many of the local jurisdiction's staff that are trying to implement this RPA do not have experience with ESA Section 7 consultations, nor with the preparation or review of aquatic habitat assessments. Additionally, there is no readily available data for developing simple and easily measurable metrics for determining potential adverse effects to fish populations associated with degradation of habitat. FEMA Region 10 and NMFS conducted local workshops in the spring of 2011 to assist participating communities with this challenge. Additional workshops may be necessary, along with a focused outreach to participating communities, in order to adequately address this challenge.

CONCLUSION

Implementation of the RPA has been a challenging and complex effort involving many stakeholders and participants. Now that the deadline for completing implementation has past, its impact is being felt throughout communities in the Puget Sound region of Washington State. Participating communities have been notified of their responsibility for complying with the Endangered Species Act, regardless of any federal involvement. For communities participating in the National Flood Insurance Program, 44 C.F.R.§60.3(a)(2) requires them to consider the need for any federal permit, such as an ESA Permit, prior to approving a floodplain development plan. Though not enforced or evaluated in the past, FEMA Region 10 is changing our compliance and monitoring program to help participating communities succeed in meeting this requirement. Partnerships have been created with state agencies charged with protecting the environment, like the Puget Sound Partnership, to help the participating communities. FEMA has developed several guidance documents for participating communities to utilize as they reevaluate and adjust their programs. FEMA Region 10 believes implementing a floodplain management program as it was originally intended and currently stated in FEMA's regulations will result in better floodplain management while protecting species and critical habitat reliant upon floodplains.

For Additional Information:
Mark Eberlein, FEMA Region 10, 425/ 487-4735 or mark.eberlein@dhs.gov

The views expressed in this article do not necessarily represent those of FEMA or the United States government.

Mark Eberlein works in his official capacity as the Regional Environmental Officer with Region 10, US Department of Homeland Security's Federal Emergency Management Agency (FEMA). His primary responsibility is to provide guidance to the internal FEMA managers and staff on compliance of their programs with the various environmental and historic laws and regulations. Additionally, he provides technical assistance and outreach to other Federal agencies, State agencies and local communities on FEMA's environmental responsibilities. Mark started working for FEMA as a Disaster Assistance Employee in 1994. He worked in the Mitigation Division, Region 10, evaluating Hazard Mitigation Grant Program projects for eligibility and writing Environmental Assessments as required by the National Environmental Policy Act. He also provided technical assistance on floodplain management to Oregon communities while assigned as a specialist with the National Flood Insurance Program.

RECLAMATION'S WATERSMART PROGRAM

WORKING TO MEET FUTURE WATER AND ENERGY DEMANDS

by Avra Morgan, WaterSMART Program Manager, Bureau of Reclamation

WaterSMART

Supply Challenges

Program Purpose

WaterSMART Focus

INTRODUCTION

The western United States is one of the fastest growing regions of the country and faces serious water and energy challenges. There will be increased demands for water from growing populations and energy needs, amplified recognition of environmental water requirements, and the potential for decreased supplies due to drought and climate change. A water balance cannot be achieved without water conservation and water reuse.

Congress recognized that an adequate and safe water supply is essential to the health, economy, security, and ecology of the country with the passage of the SECURE Water Act in 2009. This law authorizes federal water and science agencies to work together with State and local water managers to plan and take action to secure water resources for the communities, economies, and the ecosystems they support.

In an effort to address these water resource challenges across the western United States and implement the SECURE Water Act, Secretary of the Interior Ken Salazar issued Secretarial Order 3297 in February 2010 and established the WaterSMART (Sustain and Manage America's Resources for Tomorrow) Program.

The purpose of the program is to secure and stretch water supplies for use by existing and future generations to benefit people, the economy, and the environment. To ensure that the purpose of the program is addressed, Interior established a framework providing federal leadership and assistance on the efficient use of water, integrating water and energy policies to support the sustainable use of all natural resources, and coordinating the water conservation activities of the various Interior bureaus and offices.

As part of the WaterSMART framework, Interior bureaus and offices coordinate and collaborate with States, Tribes, local governments, universities, and non-governmental organizations to lead towards a sustainable future.

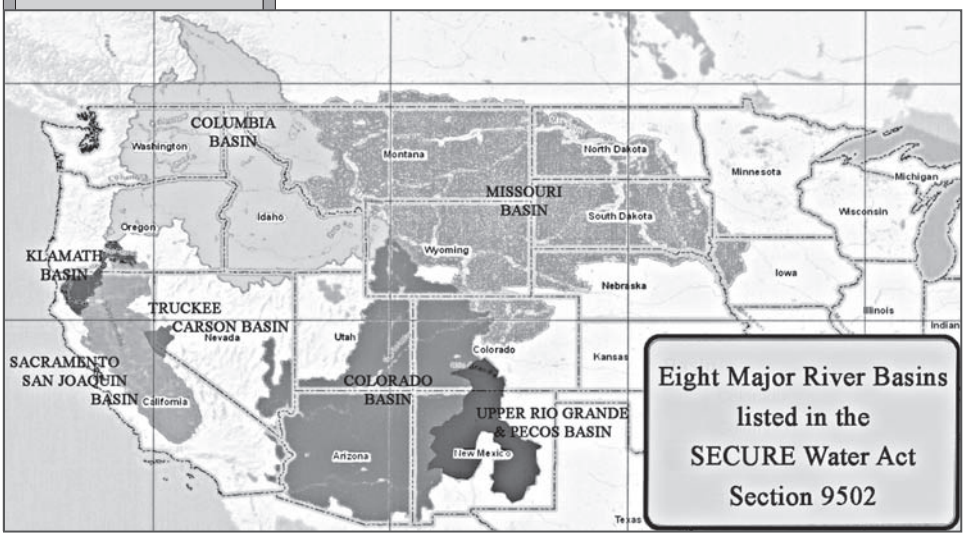
WaterSMART has provided more than $85 million in competitively-awarded funding to non-federal partners, including Tribes, water districts, and universities.

OVERVIEW OF WATERSMART ACTIVITIES

The US Department of the Interior's (Interior's) Bureau of Reclamation (Reclamation) has taken on the challenge and plays a key role in WaterSMART as Interior's main water management agency. Reclamation's mission is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

WATERSMART INCLUDES:

- cost-shared funding for water and energy management improvement projects
- basin-wide efforts to evaluate and address the impacts of climate change
- funding of water reuse and recycling projects
- establishment and expansion of collaborative watershed groups
- various smaller-scale water conservation improvements and planning efforts



Focused on improving water conservation and helping resource managers make wise water use decisions, Reclamation's portion of the WaterSMART Program is achieved through administration of grants, scientific studies, technical assistance, and scientific expertise.

The components of Reclamation's WaterSMART Program include: the Basin Study Program; WaterSMART Grants; Title XVI Water Recycling and Reuse Program; Cooperative Watershed Management Program; Water Conservation Field Services Program; and the WaterSMART Clearinghouse. As discussed below, each program has specific objectives that help to achieve water resources sustainability.

WaterSMART

Climate Change

Colorado River Basin

Resource Management

BASIN STUDY PROGRAM

Reclamation is conducting basin-wide efforts to evaluate and address the impacts of climate change through the Basin Study Program. These basin-wide efforts are addressed by three program activities: 1) Basin Studies; 2) Desert and Southern Rockies Landscape Conservation Cooperatives; and 3) West-Wide Climate Risk Assessments. These activities are complementary and represent a three-pronged approach to developing landscape-level strategies. Program goals will be attained through identifying and utilizing: the best available science; coordination and communication pathways; assessments of climate change risks and impacts; and viable adaptation and mitigation strategies.

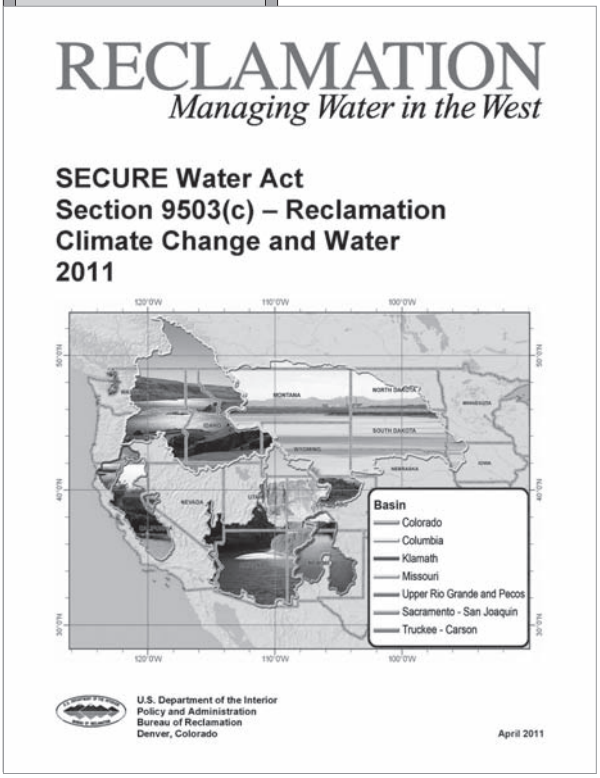
Through the Basin Studies, Reclamation works with States, Indian Tribes, and local partners to comprehensively assess potential water supply imbalances in river basins, climate change impacts, and identify mitigation and adaptation strategies to address those potential impacts. Reclamation will continue to work with non-federal participants to consider and develop appropriate strategies to mitigate or adapt to these impacts. For example, the Colorado River Basin Water Supply and Demand Study is being conducted by Reclamation, stakeholders, and agencies representing the seven basin States: Wyoming, Colorado, New Mexico, Utah, Arizona, Nevada, and California. This study assesses future water supplies and demands, reliability of the Colorado River system, and developing and evaluating adaptation and mitigation strategies to address future water supply and demand imbalances. [*See* Jerly, Fulp & Adams, ***TWR*** #90]

The information used in the Basin Studies includes state-of-the-art projections of water supply and demand that will leverage the work conducted through the Landscape Conservation Cooperatives and West-Wide Climate Risk Assessments.

Landscape Conservation Cooperatives

Landscape Conservation Cooperatives (LCCs) are management and science partnerships that address climate change and other stressors across the landscape. They are generally comprised of governmental entities, Tribes, universities, and non-governmental organizations that have complementary conservation goals and work together on shared priorities. They are focused on providing science development, coordination, and communication to support resource management at the landscape scale. They bring applied science tools to resource managers to support conservation efforts.

Reclamation is co-leading the establishment of the Desert and Southern Rockies LCCs. In support of this effort, Reclamation awarded $1.2 million this year for cost-shared, applied science grants. These applied science grants are intended to enhance the management of natural and cultural resources in a changing climate. For example, Colorado State University will model low streamflow and assess the ecological impacts of potential stream drying under climate change in the Upper Colorado River Basin.



West-Wide Climate Risk Assessments

West-Wide Climate Risk Assessments (WWCRAs) are reconnaissance-level water supply and demand analyses conducted within river basins. They include projections of climate change impacts to water supply and demand and baseline risk assessments to evaluate the impacts of climate change to water users. Through this activity, a consistent approach will be applied throughout the western United States to assess the impacts of climate change to water supplies and provide a baseline for more in-depth analyses performed through future Basin Studies.

In March 2011, Reclamation provided an initial report to Congress as required under Section 9503 of the SECURE Water Act, Subtitle F of Title IX of P.L. 111-11, addressing Reclamation's activities under the Basin Studies and WWCRAs (Report). This Report represents the first consistent and coordinated assessment of risks to future water supplies across eight major Reclamation river basins. (Report available from: www.usbr.gov/climate/).

This Report summarizes the best available information regarding the effects of climate change on water resources in the West. It is not a decisional document and does not make recommendations. The Report was developed by Reclamation and was peer reviewed externally.

The Report provides a foundation from which Reclamation can continue to work with stakeholders on more geographically focused analyses, including the Basin Studies and the LCCs. The information supports the process of identifying appropriate adaptation strategies for sustainable water resources management.

WaterSMART

Temperature & Precipitation

The Report notes that:

> Much of the Western United States has experienced warming during the 20th century (roughly 2 degrees Fahrenheit (°F) in the basins considered within this report) and is projected to experience further warming during the 21st century with central estimates varying from roughly 5–7°F, depending on location.
>
> Report, p. vii

A majority of projections suggest that precipitation will increase over the northwestern and north central portions of the western United States and decrease over the southwestern and south central areas. Future reports under the authorities of the SECURE Water Act will address projected demand changes and how the changes in supply and demand will impact the operations of the Secretary of the Interior.

In 2011, $8.3 million is being leveraged to evaluate and address the impacts of climate change through the Basin Study Program.

WaterSMART GRANTS

WaterSMART Grants are intended to leverage federal funds on cost-shared projects that will have a near-term impact on water and energy efficiency and improved water management. Under WaterSMART Grants, Reclamation makes available four funding opportunities. Each funding opportunity has a specific objective to address water resource sustainability.

Funding Categories

WaterSMART funding categories include:

1) Water and Energy Efficiency Grants
2) System Optimization Reviews
3) Advanced Water Treatment Pilot and Demonstration Projects
4) Grants to Develop Climate Analysis Tools

In 2011, $33 million was available for new WaterSMART Grant projects. The President's budget request for 2012 includes $18.5 million for WaterSMART Grants.

Water & Energy

Water and Energy Efficiency Grants

These grants focus on construction projects that: conserve and use water and energy more efficiently; increase energy efficiency and the use of renewable energy; protect endangered species; or facilitate water markets. Reclamation funded 58 projects to receive $24.6 million in grants in 2011.

For example, with funding provided in 2010 the Henry Miller Reclamation District in California is modernizing the Temple Santa Rita Canal system by retrofitting existing check structures with long-crested weirs and flap gates and installing an automatic flow control structure. Overall, three flap gates, five long-crested weirs and one flow control structure with two supervisory control and data acquisition-operated gates will be installed. The improvements will result in a more precise water level control, ultimately reducing unnecessary spills and is expected to conserve 8,900 acre-feet of water annually.

Construction workers filling concrete forms for a long crested weir upstream of a check structure in the Temple Santa Rita Canal System.

Conservation Goal

Water and Energy Efficiency Grants, along with other WaterSMART activities such as Title XVI Water Recycling and Reuse projects, contribute to Interior's Priority Goal for Water Conservation. That goal is to enable capability to increase available water supply for agricultural, municipal, industrial, and environmental uses in the western United States up to 350,000 acre-feet by 2012.

WaterSMART

Irrigation Improvement

System Optimization Reviews

System Optimization Reviews are intended to take a broad look at system-wide efficiency, focusing on improving efficiency and operations of a water delivery system, water district, or water basin. The System Optimization Review results in a plan of action on improving efficiency and operations on a regional or basin perspective. In 2011, approximately $950,000 was used to select eight new System Optimization Reviews for funding.

For example, with funding provided in 2010 the Harlingen Irrigation District is conducting a System Optimization Review in the Lower Rio Grande Valley in Texas. The District is in the process of measuring past water conservation improvements to prioritize future projects. Additionally, the District is assessing canal conveyance efficiency, application of supervisory control and data acquisition, automation, control structures, river and ancillary pumping, off-channel storage, and re-regulation of storage.

Treatment Grants

Advanced Water Treatment Pilot and Demonstration Grants

These grants are available for the construction of pilot and demonstration projects that address the technical, economic, and environmental viability of treating and using brackish groundwater, seawater, impaired waters, or otherwise creating new water supplies within a specific locale. In 2011, Reclamation funded four projects for a total of approximately $2 million.

For example, the Los Angeles Department of Water and Power is testing the ability of a biological treatment process to remove nitrates, perchlorate, and volatile organic compounds from the groundwater in the area. The full-scale project will provide 77,438 acre-feet of treated water annually, reducing the city's need for imported water from the California State Water Project.

Climate Analysis

Grants to Develop Climate Analysis Tools

These grants are available to develop tools to assess the impacts of climate change on water resources. In 2011, Reclamation selected seven new projects totaling $1.25 million. For example, the Desert Research Institute in Nevada is developing and evaluating regional climate downscaling techniques that will benefit understanding future surface and groundwater supplies.

Watershed Groups

COOPERATIVE WATERSHED MANAGEMENT PROGRAM

Collaboration among stakeholders is crucial in reducing conflicts over water and improving water quality and ecological resilience at the local level. As an effort to address these concerns, Interior will provide financial assistance through the Cooperative Watershed Management Program to establish and expand collaborative watershed groups and to fund watershed management projects that enhance water conservation, improve water quality and ecological resiliency, reduce water conflicts, and advance other goals related to water quality and quantity. This program is being directed by multiple Interior bureaus, including Reclamation and the US Geological Survey, with input and feedback from States, Tribes, other federal agencies, and other stakeholders.

Reclamation is taking the lead to develop the process for selecting and overseeing the award of financial assistance for the establishment of watershed groups and the funding of watershed management projects. Reclamation is planning to post a funding opportunity announcement in 2012 for the establishment and expansion of watershed groups.

Conservation at Federal Projects

WATER CONSERVATION FIELD SERVICES PROGRAM

The Water Conservation Field Services Program (WCFSP) was established 1996 to proactively encourage water conservation in the operations of recipients of water from federal water projects and to assist agricultural and urban water districts in preparing and implementing water conservation plans in accordance with the Reclamation Reform Act of 1982. WCFSP makes available cost-shared financial assistance to Reclamation's regional and area offices for water conservation planning activities, on-the-ground efficiency improvements, demonstration projects, education and training, and technical assistance from Reclamation.

Funding opportunity announcements are developed by Reclamation's regional and area offices and funded using Reclamation-wide selection criteria that reflect a priority on water conservation planning and on-the-ground efficiency improvements. In 2012, $5.1 million has been requested for the WCFSP Program. Availability for awards will vary by Reclamation region.

WaterSMART

Reclaimed Water

Water Recycling

TITLE XVI - WATER RECYCLING AND REUSE PROGRAM

Reclamation's Title XVI Water Recycling and Reuse Program develops and supplements urban and irrigation water supplies through water reuse. Water reuse improves water system efficiency, provides flexibility during water shortages, and diversifies the water supply. Title XVI projects reclaim and reuse municipal, industrial, domestic or agricultural wastewater, and naturally impaired groundwater and/or surface waters. These projects provide growing communities with new sources of clean water while promoting water and energy efficiency and environmental stewardship.

Reclaimed water can be used for a variety of purposes, such as: environmental restoration; fish and wildlife; groundwater recharge; appropriate municipal, domestic, industrial, or agricultural uses; power generation; or recreation. Water reuse is an essential tool for stretching limited water supplies in the West.

Through the Title XVI Program, Reclamation provides financial and technical assistance to local water agencies for the planning, design, and construction of water reclamation and reuse projects.

Title XVI provides Reclamation authority to provide funding up to the federal appropriations ceiling (typically $20 million) or 25 percent of the cost of planning, design, and construction of specific water recycling projects — whichever is the lesser amount. Sponsors of water reclamation and reuse projects specifically authorized for funding under Title XVI will once again be eligible to apply for funding in 2012.

In 2011, $20.6 million in federal funding was provided for 12 Title XVI projects. Projects were selected for funding based on criteria which focussed on: reducing existing diversions or addressing specific water supply issues in a cost-effective manner; addressing environmental and water quality concerns; and meeting other program goals.

For example, the Inland Empire Utilities Agency will drill three wells in the Chino Creek Area (southern California) and connect those wells to an existing pipeline that delivers raw water to the Chino Desalter for treatment. The new wells will allow for increased collection of brackish groundwater that will reclaim an additional 2,900 acre-feet of water a year.

In an effort to continue leveraging funds for Title XVI projects Reclamation has requested $29 million for projects in 2012.

WaterSMART at Work

WATER TREATMENT MODIFICATIONS: WASTEWATER RECYCLING - DISCHARGE ELIMINATION

Bella Vista Water District in Redding, California, received a $300,000 grant to implement modifications to the District's water treatment plant that allow the treatment plant to capture and recycle backwash and filter-to-waste water used at the treatment plant that had previously been going to waste. These modifications will reduce the amount of energy used to pump this water into the District's distribution system and reduce the District's diversion from the Sacramento River by 540 acre-feet per year.

The project will eliminate the existing discharge into dry gulch and the undiverted water will benefit designated critical habitat and the stretch of the Sacramento River upstream of the Red Bluff Diversion Dam, which is prime spawning ground for Chinook salmon. The estimated energy savings due to the reduced head pumping from the recycle ponds instead of the Sacramento River is approximately 146,067 Kilowatt-hours of electricity per year.

The project has been operationally complete since near the end of May 2011 (they have been recycling all of the backwash water since May 26th). In less than four months of operation, this project has already conserved 273 acre-feet of water that would have otherwise been diverted directly from the Sacramento River and conserved 71,000 Kilowatt-hours of electricity.

Workers installing a section of 24-inch recycle pipeline in the existing dike around the west pond at the water treatment plant.

Workers lowering the second of two 25 horse-power vertical turbine pumps into place at the recycle pump station.

WaterSMART

Internet Clearinghouse

Funding

WaterSMART CLEARINGHOUSE

Reclamation is partnering with States, Tribes, and local entities to develop the "WaterSMART Clearinghouse" as a resource to provide leadership and assistance in coordinating and integrating water conservation and sustainable water strategies. The Clearinghouse brings stakeholders together to identify best practices and cost-effective technologies for water information collection, analysis, and delivery that will be essential in addressing global water issues in the 21st century. The Clearinghouse is used to find and share websites providing information on water conservation and sustainability. This internet-based program is accessible to the public and everyone is encouraged to contribute. The Clearinghouse can be viewed at www.doi.gov/watersmart/.

FUTURE OPPORTUNITIES TO PARTICIPATE IN WATERSMART ACTIVITIES

The President's 2012 Budget request includes a total of $58.9 million for the WaterSMART Program.

As part of this effort, Reclamation is planning the following activities for 2012:

WaterSMART FUNDING & GRANTS TABLE

Funding Opportunity / Grant Type	Planned Funding Opportunity Announcement Date	2012 Funding Amount Requested
Water and Energy Efficiency Grants	Fall 2011	$18.5 million
System Optimization Reviews	Fall 2011	
Advanced Water Treatment	Winter 2011	
Climate Analysis Tools	Winter 2011	
Title XVI	Fall 2011	$29.0 million
Applied Science Grants for the Desert LCC	Spring 2012	$1.25 million
Applied Science Grants for the Southern Rockies LCC	Spring 2012	$1.25 million
Cooperative Watershed Management Program	Fall / Winter 2012	$250,000
Water Conservation Field Services Program	Dates for funding opportunities vary by Reclamation region	$5.1 million total (Funding amounts vary by Reclamation Region)

CONCLUSION

Reclamation will continue to invite participation in future WaterSMART activities and most of the funding opportunities will be posted online at www.grants.gov. In addition, Reclamation will initiate the selection process for 2012 Basin Studies in Spring 2012. The funding amount requested for 2012 Basin Studies is $2.5 million.

For Additional Information:
Avra Morgan, Reclamation (Denver, CO)
303/ 445-2906 or aomorgan@usbr.gov

WaterSMART program website: www.usbr.gov/WaterSMART.

Jeremy Mikrut, Program Analyst for the Bureau of Reclamation, also contributed to this article.

Avra Morgan is the manager of the Program Management Office in Policy and Administration in Denver, and is Reclamation's lead for the WaterSMART Program. Currently, she is leading Reclamation's effort to develop Landscape Conservation Cooperatives. Before joining Reclamation in 2004, Avra worked as a water rights attorney, representing cities and water districts.

WATER BRIEFS

KLAMATH DAM REMOVAL CA/OR

REMOVAL STUDIES RELEASED

On September 21, Secretary of the Interior Ken Salazar announced that the federal government had completed numerous peer-reviewed scientific and technical studies providing detailed information about the environmental and economic impacts of removing four Klamath River hydroelectric dams. The Klamath Hydroelectric Project (Project) is owned by PacifiCorp. The studies fulfilled a major condition of the Klamath Hydroelectric Settlement Agreement (KHSA), negotiated among state, local, tribal and water provider leaders and announced in February 2010. KHSA was completed for the express purpose of resolving the pending FERC relicensing proceedings (No. 2082) by establishing a process for potential Facilities Removal and operation of the Project until that time. *See* Water Briefs*, TWR* #73 and Spain, *TWR* #70 and #71. The four dams are located downstream from the Bureau of Reclamation's project features associated with the Klamath Basin Project.

The analysis and studies describe pluses and minuses to potential dam removal on the Klamath River. They reveal that, over the next few decades, dam removal and the implementation of a related watershed-wide restoration program could significantly increase salmon harvests in the river and ocean, eliminate the toxic algae blooms in reservoirs, and restore more normal water temperatures in the river.

Dam removal could also result in some small increases in long-term flood risks as well as short-term impacts on juvenile fish populations from the release of the sediment built up behind the dams (13.1 million cubic yards). The studies also describe how these risks could be mitigated. Removal of the dams, combined with restoration of aquatic habitats as anticipated in the KBRA, is expected to increase the median annual production of adult Chinook salmon by 81.4%. Coho salmon from the Upper Klamath River population would be expected to reclaim 68 miles of habitat, including approximately 45 miles in the mainstem Klamath River and tributaries as well as an additional 23 miles currently inundated by the reservoirs. Dam removal will not have any direct impact on water supplies in the basin as these facilities do not provide storage for irrigation uses.

While the dam removal would result in the loss of hydroelectric power generation (716,800 MWh annually) and the loss of around 50 jobs from managing those facilities, it would also create a substantial number of jobs — varying in nature, duration, and location — estimated at approximately 1,400 during the short-term. Over the full period of analysis, the Klamath Basin Restoration Agreement (KBRA) is estimated to support approximately 4,600 jobs. While many factors impact employment estimates over a 50-year economic study period, an estimated 450 jobs would be supported on average annually from the dam removal and as improvements to water quality and fisheries occur.

A federal study also shows that the most probable cost of full removal of the four dams falls significantly under the $450 million state cost-cap negotiated in KHSA. The most probable estimate of the cost of full dam removal, and associated mitigation actions, is $291.6 million (2020 dollars since this is when the dams would be removed). This estimate includes $76.6 million for dam facilities removal and $21.7 million for reservoir restoration.

The dams currently generate enough electricity to power roughly 70,000 homes. If the dams are retained, however, the additional costs from construction of required fish passage facilities — which would be substantial — will likely be passed on to ratepayers. KHSA also calls for the parties to pursue opportunities on development of replacement energy.

The Department of the Interior, in association with the California Department of Fish and Game, also released an environmental analysis known as a Draft Environmental Impact Statement/Environmental Impact Report (Draft EIS/EIR). According to the terms of KHSA, Secretary Salazar will make a final decision on dam removal based on a complete review of the scientific and technical data as well as the information in an environmental analysis, which includes input from the public.

The Draft EIS/EIR identifies the effects of the proposed action — dam removal and implementation of the KBRA — as well as several other alternatives, including options for leaving all dams in place as well as options for leaving two dams in place. The KBRA is a watershed-wide program to restore fisheries, improve water quality and provide water supply certainty to communities and water users in the Basin.

The Draft EIS/EIR was prepared by the Department of the Interior, through the Bureau of Reclamation and the California Department of Fish and Game. The 60-day public comment process for the Draft EIS/EIR is open until November 21, 2011. Visit the website below to view the Draft EIS/EIR and obtain a schedule for public hearings as well as instructions for submitting written comments.

A final decision by the Secretary is expected in March 2012. If the Secretary opts to remove the dams, the Governors of Oregon and California will have 60 days to concur. The Secretary has been charged to use his best efforts to determine whether in his judgment Facilities Removal: will advance restoration of the salmonid fisheries of the Klamath Basin; is in the public interest, including potential impacts on affected local communities and Tribes; and whether the costs of Removal as estimated will not exceed the State Cost Cap ($450 million).

For info: Adam Fetcher, DOI, 202/ 208-6416; Kristin MacIntyre (California), 916/ 654-9937; Tim Raphael (Oregon), 503/ 689-6117; Summary of the studies is available at: www.klamathrestoration.gov

WATER BRIEFS

PHARMACEUTICALS & WATER US

GAO REPORT

The General Accountability Office (GAO) released a report dated August 8, 2011, entitled "Environmental Health: Action Needed to Sustain Agencies' Collaboration on Pharmaceuticals in Drinking Water." (GAO-11-346). Drinking water in some metropolitan areas contains concentrations of pharmaceuticals, raising concerns about their potential impact on human health. The Safe Drinking Water Act (SDWA) authorizes EPA to regulate contaminants, including pharmaceuticals, in public drinking water systems if they may adversely affect human health among other criteria. Pharmaceuticals may enter drinking water supplies from several pathways, including discharge from wastewater facilities. GAO was asked to provide information on: (1) the extent to which pharmaceuticals occur in drinking water and their effects, if any, on human health; (2) US and other countries' approaches to reducing their occurrence; and (3) challenges, if any, that EPA faces in determining whether to regulate pharmaceuticals. GAO reviewed federal and peer-reviewed reports, and surveyed a nonprobability sample of five US programs designed to properly dispose of pharmaceuticals. GAO selected those programs based on geographic diversity and program characteristics. It also researched such programs in two countries, and interviewed scientists and agency officials.

Scientists have identified numerous pathways by which pharmaceuticals may enter the environment and ultimately drinking water supplies. According to USGS scientists, the main source of human pharmaceuticals in the environment is likely treated wastewater from households, industry, and commercial facilities. Biosolids from wastewater treatment plants applied to land as fertilizer may also be a source of human pharmaceuticals in the environment. Septic systems may be a source of human pharmaceuticals in groundwater. A potential source of veterinary pharmaceuticals is agricultural facilities where large numbers of food-producing animals (such as chickens, cattle, and swine) are treated with pharmaceuticals. The pharmaceuticals enter the environment either directly from waste storage structures as a result of accidents or weather conditions, or through the application of manure and liquid waste to croplands.

Research has detected pharmaceuticals in the nation's drinking water. National and regional studies by the U.S. Geological Survey (USGS), EPA, and others have detected pharmaceuticals in source water, treated drinking water, and treated wastewater; but the full extent of occurrence is unknown. The concentrations detected for any one pharmaceutical were measured most frequently in parts per trillion. Research has not determined the human health effects of exposure to these concentrations of pharmaceuticals in drinking water. However, federal research has demonstrated the potential impact to human health from exposure to some pharmaceuticals found in drinking water, such as antibiotics and those that interfere with the functioning and development of hormones in humans.

Some states and local governments as well as the Drug Enforcement Administration have taken actions that could reduce the extent to which pharmaceuticals occur in drinking water. These efforts have primarily been through drug take-back programs to encourage proper control and disposal of pharmaceuticals. Additional efforts have been adopted in Europe following the European Union's directive in 2004 requiring member states to have appropriate collection systems for unused or expired medicinal products. In addition to collection systems, Sweden also encourages actions such as writing small initial prescriptions to reduce the amount of pharmaceuticals that are disposed of if patients switch to a different pharmaceutical course.

EPA faces challenges in obtaining sufficient occurrence and health effects data on pharmaceuticals and other contaminants in drinking water to support analyses and decisions to identify which, if any, pharmaceuticals should be regulated under SDWA. EPA is collaborating with the Food and Drug Administration and USGS on research to help obtain such data but these efforts are largely informal. EPA officials said there is no formal mechanism, such as a long-term strategy or formal agreement, to manage and sustain these collaborative efforts. A recently expired interagency workgroup, which EPA co-chaired, initiated work on a research strategy to identify opportunities that will enhance collaborative federal efforts on pharmaceuticals in the environment, but its draft report did not contain key details about how the agencies will coordinate such collaborative efforts. GAO previously identified key practices for enhancing and sustaining collaboration among federal agencies, some of which may help clarify such coordination, such as establishing the roles and responsibilities of collaborating agencies; leveraging their resources; and establishing a process for monitoring, evaluating, and reporting to the public the results of the collaborative research efforts.

To collect the pharmaceutical occurrence and health effects data necessary to better implement SDWA, and to address the broader issue of pharmaceuticals and their relationship to other contaminants in the nation's waterways, GAO recommends that the Administrator of EPA establish a workgroup or other formal mechanism that includes the relevant federal agencies to collaborate and coordinate research on pharmaceuticals and, as appropriate, other contaminants in drinking water that present the greatest public health concern. In establishing this mechanism, EPA should: (1) define roles and responsibilities, including how the collaborative effort will be led; (2) identify the expertise and other resources that each agency can bring to bear on the issue; and (3) develop a process for monitoring, evaluating, and reporting to the public the results of the collaborative research efforts. EPA agreed with the recommendation. When GA confirms what actions EPA has taken in response to this recommendation, it will provide updated information.

For info: David C. Trimble, GAO: Natural Resources and Environment, 202/ 512-9338 or trimbled@gao.gov; see the report for more details at: www.gao.gov/products/GAO-11-346

WATER BRIEFS

URANIUM PLAN NM/NAVAJO

EPA CLEANUP PLAN ANNOUNCED

On September 29, EPA announced it has approved a plan and committed to clean up the Northeast Church Rock Mine, the largest and highest priority uranium mine on the Navajo Nation. The cleanup will include removal of approximately 1.4 million tons of radium and uranium contaminated soil and will employ the most stringent standards in the country. The cleanup will place the contaminated soil in a lined, capped facility. The multi-year cleanup will be conducted in phases.

The disposal cell will be designed with participation from the Navajo Nation, New Mexico, US Nuclear Regulatory Commission (NRC), and US Department of Energy (DOE). EPA will fund an independent technical advisor to aid the community in their understanding of the project as it develops and facilitate local input into the design process. The cleanup will allow unrestricted surface use of the mine site for grazing and housing.

The lands of the Navajo Nation include 27,000 square miles spread over three states in the Four Corners area. The unique geology of these lands makes them rich in uranium, a radioactive ore in high demand after the development of atomic power and weapons at the close of World War II in the 1940s. Northeast Church Rock mine operated as a uranium ore mine from approximately 1967 to 1982, and included an 1800-foot deep shaft, waste piles, and several surface ponds. Under EPA oversight and in conjunction with the Navajo Nation EPA, General Electric conducted two previous cleanups at the site to deal with residual contamination, including the removal and rebuilding of one building in 2007, and removal of over 40,000 tons of contaminated soil in 2010.

At the request of the US House Committee on Oversight and Government Reform in October 2007, EPA, along with the Bureau of Indian Affairs, the NRC, DOE, and the Indian Health Service developed a coordinated Five-Year Plan to address uranium contamination in consultation with Navajo Nation EPA. EPA regularly reports back to the Committee and to the Navajo Nation on its progress in implementing the Five-Year Plan. The Progress Report was updated in August 2011 (see website below).

EPA is addressing the most urgent risks on the reservation — uranium contaminated water sources and structures. Approximately 30% of the Navajo population does not have access to a public drinking water system and may be using unregulated water sources with uranium contamination. EPA is also working with the Navajo Nation to identify and enforce against responsible parties as part of a Five-Year Plan to address the problem.

For info: Margot Perez-Sullivan, EPA, 415/ 328-1676, perezsullivan.margot@epa.gov or www.epa.gov/region9/superfund/navajo-nation/

MISSOULA WATER SALE MT

CARLYLE GROUP PURCHASE PROPOSED

The Montana Public Service Commission (PSC) is in the process of reviewing a proposed sale of the Mountain Water Company (Mountain Water) to the Carlyle Group (Carlyle), the world's largest private investment firm. Mountain Water is a privately owned water utility that provides drinking water to 50,000 Missoula-area residents, and owns water rights to tap the aquifer and to use Rattlesnake Creek water, having purchased the utility from Montana Power Company in 1979 for $7.5 million. The utility has never been owned by the public. A public hearing was held on September 26-27 and final briefs on the proposed sale are due October 25. The City of Missoula (Missoula), Clark Fork Coalition (CFC), Montana Consumer Counsel, and Carlyle are all parties to the case.

CFC, a Montana environmental group which recently merged with the Montana Water Trust, is supporting the sale of the utility to the Carlyle Group. CFC believes that "public ownership of Mountain Water is the best way to support Missoula's irreplaceable water resources and our need for clean, safe, affordable, and reliable water far into the future. Although it may seem counter-intuitive to ask PSC to approve the sale to Carlyle, we believe this is the best option for achieving City ownership of our water utility." CFC website.

CFC's support of the sale is based on an Agreement reached on September 22 between CFC, Missoula and Carlyle (see website below). "This sale is a once-in-a-century opportunity for the people of Missoula to control their own precious water. Between the stipulations in the September 22nd agreement between CFC, the City and Carlyle, PSC's regulatory authority to protect the public, and Montana's strong water laws, there are safety mechanisms in place to ensure Carlyle is a responsible stepping stone on the path to public ownership. The three-way agreement gives CFC assurances that the Rattlesnake [Creek] is safe, Missoula's water stays home, and the people of Missoula have a legitimate shot at becoming the next owner of the water." The Agreement: 1) ensures Missoula's water will stay in the watershed; 2) ensures Rattlesnake Creek water rights will only be used as emergency back-up supply; and 3) gives Missoula the chance to make an offer on Mountain Water at any time, and 120 days to make an offer when the utility (or any of its parts) is sold by Carlyle. *Id.*

CFC also noted that Mountain Water is not willing to sell the utility to Missoula and that the PSC cannot order such a sale. *Id.* The PSC's goal is to make a decision by the end of 2011.

For info: www.clarkfork.org

CONSERVATION REBATES CA

WATER DISTRICT PROGRAM

Some of the leading Silicon Valley businesses, including Lockheed Martin, are taking advantage of Santa Clara Valley Water District's (District's) water conservation rebate programs to cut costs and reduce their carbon footprint. The District offers a number of conservation rebate programs to both residents and businesses in Santa Clara County. The District manages an integrated water resources system that includes the supply of water, flood protection, and stream stewardship on behalf of Santa Clara County's 1.8 million residents.

WATER BRIEFS

The District's Landscape Rebate Program provides landscape conversion rebates and irrigation hardware upgrade rebates that can be combined or issued separately. Through this program, Lockheed Martin converted a total of 24,532 square feet of irrigated turf to qualifying low water using landscape and overhead spray irrigation to drip irrigation at two of its Bay Area campuses. The company also upgraded 31 irrigation controllers to weather-based irrigation controllers. These changes will save an estimated 2.7 million gallons of water a year.

Lockheed Martin's participation in the High-Efficiency Toilet Program, which provides the toilets and installation free of charge, allowed them to replace 325 toilets and 180 urinal flush valves at no cost. The District also provided 55 faucet aerators, which inspired the company to purchase and install an additional 445 aerators. The equipment savings alone was nearly $125,000. The total estimated amount of water conserved is nearly eight million gallons per year, with an estimated savings of $64,000 per year in ongoing water and sewer costs.

About half of the water in the county is imported. These supplies continue to be limited due to stressors on the Sacramento-San Joaquin Delta and growing pressure on the state's water delivery system. To ensure future water needs, the District has set a goal of conserving 100,000 acre-feet per year by 2030. Reaching this goal will require a sustained, aggressive effort, which is why the District encourages residents and companies alike to take advantage of rebate programs and other water conservation services.

For info: District website: www.valleywater.org

GULF COAST RESTORATION US EPA ECOSYSTEM STRATEGY RELEASED

On October 5, the Gulf Coast Ecosystem Restoration Task Force (Task Force), chaired by EPA Administrator Lisa Jackson, released its comprehensive preliminary strategy for long-term ecosystem restoration. The preliminary strategy is the first effort of its kind to be developed with the involvement of parties throughout the region, including the states, tribes, federal agencies, local governments, and interested citizens and organizations.

The strategy, which builds upon on-going efforts underway in the Gulf Coast states, includes specific steps for on-the-ground action and represents the Task Force's commitment to putting Gulf coastal restoration on an equal footing with other national priorities. President Obama established the Task Force by executive order a year ago, in response to a report by Secretary of the Navy Ray Mabus. The group is made up of representatives from the five Gulf States and 11 federal agencies, including EPA, Council on Environmental Quality, Department of the Interior, Department of Commerce, Department of Defense, Department of Agriculture, Department of Justice, Department of Transportation, Office of Management and Budget, Office of Science and Technology Policy, and Domestic Policy Council.

"Even before last year's oil spill, the Gulf of Mexico endured decades of decline that threatened the environmental and economic health of this region. This strategy is designed to prepare the region for transitioning from a response to the spill into a long-term recovery that supports the vital ecosystem and the people who depend on it," said Administrator Jackson. "The Task Force's draft strategy identifies fundamental obstacles that have plagued restoration and protection efforts in Louisiana and other states for decades. The report attempts to begin reversing 80 years of mismanagement," said Garret Graves, Task Force vice-chair and chair of the Coastal Protection and Restoration Authority of Louisiana. "It identifies critical issues such as changes in river management, the use of dredged sediment, navigation channel bank stabilization, and the need to expedite the snail's pace process of implementing water resources projects."

Stopping the loss of critical wetlands, sand barriers, and beaches is a key recommendation of the preliminary strategy. Key habitats for a wide range of fish and other animals are being lost or reduced across the Gulf. The creation of channels and levees from dredging in the Lower Mississippi often can "disconnect" the vast wetland delta from the source of sediments that built the delta over thousands of years. The strategy aims to restore the supply of sediments needed to build up eroding wetlands and to ultimately reconnect these valuable resources to their historic source of sediments, particularly in the Lower Mississippi. The strategy recommends placing ecosystem restoration on an equal footing with historic uses such as navigation and flood damage reduction by approaching water resource management decisions in a far more comprehensive manner that will bypass harm to wetlands, barrier islands, and beaches. The strategy also recommends implementation of several congressionally authorized projects in the Gulf that are intended to reverse the trend of wetlands loss.

The strategy also calls for working in the Gulf and upstream in the Mississippi watershed to reduce the flow of nutrients into the Gulf by supporting state nutrient reduction frameworks, new nutrient reduction approaches, and targeted watershed work to reduce agricultural and urban sources of nutrients. The strategy recommends addressing the complex issues surrounding the excess transport of nutrients to the Gulf coast by broadly supporting action-oriented innovations from all sectors that address both the environmental as well as the economics of effective nutrient management.

The strategy calls for enhancing the quality of life of Gulf residents by working in partnership with coastal communities. Additionally, the Task Force will immediately begin reviewing existing policies, programs, and regulations that are slowing down restoration progress, particularly in the habitat restoration area. The Task Force will also explore innovative ways to implement restoration, measure success, and support the restoration with science. Comments are open until October 26 and the final version will be released in December.

For info: Strategy available at: www.epa.gov/gulfcoasttaskforce

WATER BRIEFS

WATER DEMAND WA

COLUMBIA BASIN FORECAST

The Draft Columbia River Basin Long-Term Water Supply and Demand Forecast (Forecast) was recently released by Washington's Department of Ecology (Ecology). Workshops to review the Forecast and garner feedback were held in September. The comment period ends on October 31. Ecology's Office of Columbia River (OCR) will release the completed Forecast, which is produced every five years for the Legislature, in November.

OCR contracted with Washington State University (WSU) to study the out-of-stream piece of the Forecast and with the Washington Department of Fish and Wildlife (WDFW) for the report's instream component. It will be the most comprehensive study of future demand ever produced in the state of Washington and employs state-of-the-art technology and scientific research to identify where additional water supply is needed. The results will guide OCR in developing a water management plan and in making strategic capital investments in water infrastructure to meet eastern Washington's environmental and economic needs.

The Forecast evaluates supply and forecasts demand on three tiers: basinwide (which includes seven states and British Columbia); at the watershed level (**w**ater **r**esource **i**nventory **a**rea or WRIA); and within a one-mile corridor along the Columbia River. The Forecast examines: water demand for four sectors (agricultural, municipal, hydroelectric, and instream flows); water supplies in the Columbia River and its tributaries; climate change impacts; and instream flows for eight critical fish basins in eastern Washington.

The report also evaluates stream conditions for critical rivers throughout Eastern Washington through a "Columbia River Instream Atlas" (Atlas) developed by WDFW. The Atlas incorporates maps and information on streamflow restoration priorities and stream-level information on fish life history stages. The Atlas shows that recovery opportunities exist in all eight WRIAs to improve fisheries, and that adopted instream flows for many of these WRIAs are routinely not met. OCR will use these tools to ensure that new water supply projects it funds will benefit instream flow and fish habitats.

Agriculture is the largest single user of water in Eastern Washington. The combined influences of climate change, economic trends and population growth will result in an increase in the amount of water needed for agricultural irrigation. The report also predicts that by 2030, diversions for cities and communities in Eastern Washington will increase by approximately 24% or an additional 109,000 acre-feet per year, based on expected population growths. Hydropower use in Eastern Washington is expected to remain fairly stable over the next 20 years, with increases in demand being met through conservation projects and power from other sources.

The Columbia River Basin is particularly sensitive to small changes in overall temperatures. Water supply modeling conducted for the Forecast predicts warmer, wetter winters, when water demand is low, and hotter, dryer summers, when demand peaks. More winter precipitation will fall as rain rather than snow, thus lessening available snowpack. Hotter, dryer summers will increase crop water demand and potentially shorten the growing season for some crops. By 2030, the model predicts an increase in average annual flow in the basin of 2%, but the timing of flows could change dramatically depending on location within the basin. For example, flows on the Columbia River at Bonneville Dam are expected to increase by up to 35% from November to May, but decrease by up to 9% from June to October.

For info: Carolyn Comeau, Ecology OCR, 509/ 454-7894 or carolyn.comeau@ecy.wa.gov; Draft Report and Instream Atlas available at: www.ecy.wa.gov/programs/wr/cwp/wsu_supply-demand.html

CLIMATE CHANGE US

LOCAL LEVEL ACTION

On August 9, the Natural Resources Defense Council (NRDC) released a 132-page report entitled "*Thirsty for Answers: Preparing for the Water Related Impacts of Climate Change*." NRDC notes on its website, "Cities across the United States should anticipate significant water-related vulnerabilities based on current carbon emission trends because of climate change, ranging from water shortages to more intense storms and floods to sea level rise. To help cities become more resilient to the rising threats of climate change, NRDC reviewed more than 75 scientific studies and other reports to summarize the water-related vulnerabilities in 12 cities across the United States. Although there may still be some uncertainty about what particular impacts threaten cities and how quickly or severely they might occur, action at the local level is the most effective method of reducing, mitigating, and preventing the negative effects of water-related climate change outlined in this fact sheet. NRDC urges cities to prepare for coming challenges relating to water resources."

For info: www.nrdc.org/water/thirstyforanswers.asp

DELTA SMELT RULINGS CA

BiOp REMANDED

U.S. District Judge Oliver Wanger recently issued a set of rulings dealing with the complex on-going litigation concerning the Delta Smelt and California's Bay-Delta. First, Judge Wanger issued a decision granting an injunction to "prevent implementation of 74 kilometer X2 target." *The Consolidated Delta Smelt Cases*, Case 1:09-cv-00407-OWW -DLB (Aug. 31, 2011); *Slip Op*. at 140 (available at: www.acwa.com/sites/default/files/news/endangered-and-invasive-species/2011/08/1013-pi-order-re-x2-8-31-11.pdf). His decision blocked an action proposed by the US Fish & Wildlife Service that would likely have caused the State Water Project to lose the use of 300,000 acre-feet of water through reservoir releases and export reductions. Judge Wanger found the 74 kilometer location proposed was not supported by any biological evidence. In a later ruling from the bench on September 16 dealing with the federal defendants' Motion to Stay the injunction, Judge Wanger issued a

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scathing review of the actions by the defendants and their experts by referring to the "agency bad faith," "absolute unreliability" and noting that "I've never seen anything like this." (*See Transcript* at www.scribd.com/doc/66074808/Wanger-9-16-11-Transcript-Motion-to-Stay-FINAL).

Judge Wanger then ruled in a 279-page decision that the 2009 Salmonid **Bi**ological **Op**inion (2009 BiOp) and Reasonable and Prudent Alternative (RPA) were arbitrary, capricious, and unlawful. *San Luis & Delta-Mendota Water Authority et al. v. Locke et al*., Case No. 1:09-CV-1053 (Sept. 21, 2011). As part of his conclusion, Judge Wanger stated, "Some of NMFS's analyses rely upon equivocal or bad science to impose RPA Actions without clearly explaining or otherwise demonstrating why the specific measures imposed are essential to avoid jeopardy and/or adverse modification. Given the potential serious impacts of these measures, the agency must do more to comply with the law." The BiOp was remanded to the National Marine Fisheries Service (NMFS) for further consideration. *Slip Op*. at 278-279.

For info: *San Luis & Delta-Mendota Water Authority* at: www.kmtg.com/fck_uploads/Salmon%20Decision.pdf

WETLANDS GRANTS US

MIGRATORY BIRDS ACQUISITIONS

Secretary of the Interior Ken Salazar announced on September 14 that the Migratory Bird Conservation Commission (Commission) approved spending more than $9 million from the Migratory Bird Conservation Fund to protect an estimated 5,550 acres of waterfowl habitat on five units of the National Wildlife Refuge System. The Commission also approved $20.7 million in federal funding for grants to conserve nearly 100,000 acres of wetlands and associated habitats in 16 states through the North American Wetlands Conservation Act (NAWCA).

The NAWCA Standard Grants will support 21 projects benefiting ducks, geese, and other migratory birds from Maine to California. Partners will contribute nearly $52 million in non-federal matching dollars toward these projects. "Partnerships are increasingly crucial to successful wetlands conservation efforts in a changing world," said Salazar, who chairs the Commission. "From the public-private partnerships supported by NAWCA grants to the close relationships our national wildlife refuges have with their surrounding communities, we depend on our partners to help us succeed in conservation."

Passed in 1989, NAWCA provides matching grants to organizations and individuals who have developed partnerships to carry out wetlands conservation projects in the United States, Canada, and Mexico. The Act was passed in part to support activities under the North American Waterfowl Management Plan, an international agreement that provides a strategy for the long-term protection of wetlands and associated upland habitats needed by waterfowl and other migratory birds in North America. NAWCA grants are funded by annual Congressional appropriations; fines, penalties and forfeitures levied under the Migratory Bird Treaty Act; interest accrued on funds under the Pittman-Robertson Wildlife Restoration Act; and excise taxes paid on small engine fuels through the Dingell-Johnson Sport Fish Restoration Fund.

For info: Kim Betton, USFWS, 703/358-2081 or Kim_betton@fws.gov; NAWCA grant programs info at: www.fws.gov/birdhabitat/Grants/NAWCA/Standard/US/2011_Sept.shtm

TCE ASSESSMENT US

INTEGRATED RISK INFORMATION SYSTEM

On September 28, EPA released the final health assessment for **tri**chloro**e**thylene (TCE) to the Integrated Risk Information System (IRIS) database. IRIS is a human health assessment program that evaluates the latest science on chemicals in our environment. The final assessment characterizes the chemical as carcinogenic to humans and as a human noncancer health hazard. This assessment will also allow for a better understanding of the risks posed to communities from exposure to TCE in soil, water, and air. It will provide federal, state, local, and other policy makers with the latest scientific information to make decisions about cleanup and other actions to protect people's health.

TCE is one of the most common man-made chemicals found in the environment. It is a volatile chemical and a widely used chlorinated solvent. Frequently found at Superfund sites across the country, TCE's movement from contaminated groundwater and soil into the indoor air of overlying buildings is of serious concern. EPA already has drinking water standards for TCE and standards for cleaning up TCE at Superfund sites throughout the country.

TCE toxicity values as reported in the assessment will be considered in: establishing cleanup methods at the 761 Superfund sites where TCE has been identified as a contaminant; understanding the risk from vapor intrusion as TCE vapors move from contaminated groundwater and soil into the indoor air of overlying buildings; revising EPA's Maximum Contaminant Level for TCE as part of the carcinogenic volatile organic compounds group in drinking water, as described in the agency's drinking water strategy; and developing appropriate regulatory standards limiting the atmospheric emissions of TCE (a hazardous air pollutant under the Clean Air Act).

EPA continues to strengthen IRIS as part of an ongoing effort to ensure concrete research and science are used to protect human health and the environment. In May 2009, EPA restructured the IRIS program to reinforce independent review and ensure the timely publication of assessments. In July 2011, EPA announced further changes to strengthen the IRIS program in response to recommendations from the National Academy of Sciences. EPA's peer review process is designed to elicit the strongest possible critique to ensure that each final IRIS assessment reflects sound, rigorous science.

For info: IRIS website: www.epa.gov/IRIS

WATER BRIEFS

RE-USE/STORAGE GRANTS OR CONSERVATION PROGRAM FUNDED

Oregon's Water Conservation, Re-use and Storage Grant Program, established by Senate Bill 1069 (2008), is designed to fund the qualifying costs of planning studies that evaluate the feasibility of developing water conservation, re-use, or storage projects. The 2011 Legislature has approved continuation of this grant program for the 2011-13 biennium. Applications for projects under $250,000 are encouraged and will be accepted by the Oregon Water Resources Department (OWRD) until December 15. Grants will be funded by Statewide Lottery-backed bonds scheduled to be issued in May 2012 and available for distribution in June 2012.

For info: Bill Fujii, OWRD, 503/ 986 0887 or www.wrd.state.or.us/OWRD/LAW/conservation_reuse_storage_grant.shtml

DAIRY MANURE RUNOFF US CAFO(S) IN SANTA ANA

EPA is ordering 13 Chino, California area dairies to comply with federal Clean Water Act (CWA) requirements to prevent dairy manure waste and other pollutants from reaching waterways. Violations included failures to: construct or maintain controls necessary to prevent manure and other contaminants from discharging into waterways; take reasonable steps to minimize or prevent discharges; develop and implement Engineered Waste Management Plans; and failure to conduct proper routine inspections of the facility.

"To protect the Santa Ana River watershed, we're taking action to ensure these dairies are prepared for the upcoming winter rains, when animal waste could flow from their dairies into nearby creeks and streams," said Jared Blumenfeld, EPA's Regional Administrator (Pacific Southwest). "We will also be evaluating whether monetary penalties are appropriate."

Inspections to evaluate CWA compliance at dairies are an ongoing focus of EPA and the California Regional Water Quality Control Board. Between November 2010 and February 2011, Water Board representatives inspected dozens of dairies in the Chino area. EPA's orders are intended to improve the dairies' environmental performance as quickly as possible by bringing them into compliance.

For info: Concentrated Animal Feeding Operation (CAFO) program website: http://cfpub.epa.gov/npdes/index.cfm >> NPDES Information, NPDES Permit Program Basics & concentrated animal feeding operations

WASTE DISPOSAL WELLS AK BANNED MOTOR VEHICLE DISPOSAL

Fort Wainwright Army base will pay over $79,000 for failing to shut down three banned motor vehicle disposal wells by the closure deadline, according to a settlement with EPA. EPA banned Class V injection wells for motor vehicle waste disposal in 1999 because of the risks to groundwater sources. Under the federal Safe Drinking Water Act, facilities in Alaska had until 2005 to permanently close this category of wells.

EPA notified the army base, located near Fairbanks, several times beginning in 2005 that the wells needed to be shut down. All the wells are located in a groundwater protection area and had potential to endanger drinking water if motor vehicle fluids such as engine oil, transmission fluid, antifreeze, and solvents were carried into the aquifer. Fort Wainwright will reclassify two of the closed wells that showed no contamination and use them as septic systems for sanitary waste only. Sampling showed that the third well did have contamination problems and it has been permanently closed. No known impacts to human health arose as a result of this contamination.

Underground injection wells are often used in areas where sewage treatment facilities are not available. When an injection well is used for fluid disposal, it is important to ensure that no harmful substances that could endanger drinking water sources are injected.

For info: Settlement available at: http://yosemite.epa.gov/r10/enforce.nsf/Current+Public+Notices/garrison_fort_wainwright_pn; info about motor vehicle waste disposal wells at: http://yosemite.epa.gov/R10/water.nsf/UIC/MVWDW

ENFORCEMENT TOOL US MAPPING FEATURE

EPA has announced a new mapping feature in its Enforcement and Compliance History Online (ECHO) database. ECHO now allows public access to federal and state enforcement information in an interactive format which can compare enforcement actions information by state. The map will be refreshed monthly.

Map users can choose to display enforcement information for actions taken at the federal level, state level, or both. Users can then click on a state to view facility locations and click on a facility to list its name, the environmental statute the facility has an enforcement action under, and a link to a detailed facility compliance report.

ECHO provides integrated information for more than 800,000 regulated facilities.

For info: ECHO available at: www.epa-echo.gov

CALENDAR

October 18 ID
From Vision to Reality: Enhancing the Lower Boise River Workshop, Boise. Washington Group Plaza, 720 Park Blvd.. For info: Idaho Rivers United, www.idahorivers.org

October 18 CA
Changing Our Perspective: New Ways of Thinking About the Delta Forum, Sacramento. Haggin Oaks Golf Complex. Sponsored by Sacramento-San Joaquin Delta Conservancy & Water Education Foundation. For info: WEF, 916/ 444-6240, feedback@watereducation.org or www.watereducation.org

October 18-19 OK
Oklahoma Governor's Water Conference, Oklahoma City. Embassy Suites Hotel. For info: www.owrb.ok.gov/news/waterconference.php

October 18-19 WA
Washington Future Energy Conference, Seattle. Washington Convention Ctr. Presented by Northwest Environmental Business Council & WA Dept. of Commerce. For info: Sue Moir, NEBC, 503/ 227-6361, sue@nebc.org or www.nebc.org

October 18-20 MT
Statistical Analysis of Groundwater Data: EPP's Unified Guidance Course, Helena. Holiday Inn. For info: EOS Alliance: www.eosalliance.org/

October 19 WA
Source Control Seminar, Seattle. For info: Holly Duncan, Environmental Law Education Center, 503/ 282-5220 or hduncan@elecenter.com

October 20 WA
Renewable Energy: Expanding Opportunities & Finaancing Update Conference, Seattle. Washington Convention Ctr. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

October 20 OR
Oregon Land Trusts Program, Portland. U of O White Stag Block, 70 NW Couch. 12-1:30pm; RSVP Amie Jamieson, 503/ 595-3922 or amie@mcd-law.com.

October 21 OR
Smart Grid: Today's Regulation & Tomorrow's Technology Conference, Portland. U of O White Stag Block, 70 NW Couch. For info: http://cubpolicycenter.org/smartgrid

October 22-29 CO
Interdisciplinary Climate Change Research Symposium: DISCCRS VI, Colorado Springs. La Foret Conference Ctr. For info: http://disccrs.org/disccrsposter.pdf

October 24-25 OK
2011 Water Conference: Integrating Technology, Social Entrepreneurship & Behavior Change, Norman. Sponsored by UO OUTREACH. For info: http://conferenceservices.ou.edu/Waterconference_2011/

October 25 CA
California Water Storage Workshop 2, Sacramento. Cal-EPA Bldg., 1001 I Street. Sponsored by California Water Commission. For info: www.cwc.ca.gov/

October 25 OR
Conservation Easements/Water Quality & Toxics Seminar, Burns. Harney Co. Community Ctr. Sponsored by Water for Life & Schroeder Law Offices. For info: Helen Moore, WFL, 503/ 375-6003 or helen.moore@waterforlife.net

October 25-27 BC
2011 Salish Sea Ecosystem Conference, Vancouver. Sheraton Wall Centre. Co-hosted by Environment Canada & Puget Sound Partnership. For info: www.salishseaconference.org/

October 26-28 AZ
WESTCAS 2012 Fall Conference - Fire & Water: Impacts on Western Water Quality, Phoenix. Crowne Plaza Airport. For info: WESTCAS, 770/424-8111 or www.westcas.org

October 27 CA
Renewable Energy Projects in California Seminar, San Francisco. Grand Hyatt. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

October 27-28 UT
Utah Water Law Conference, Salt Lake City. Hotel Monaco. For info: CLE International, 800/ 873-7130 or website: www.cle.com

October 27-28 NV
Tribal Water Law Seminar, Las Vegas. Aria Resort & Casino. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

October 28 CA
Water Planning for Commercial, Residential & Industrial Development Seminar, Santa Monica. Sheraton Delfina. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

October 29 OR
Celebration of Oregon Rivers - 9th Annual, Portland. Ambridge Ctr. Presented by WaterWatch of Oregon. For info: WW website: http://waterwatch.org/

October 31 CO
Upper Colorado River Basin Water Forum, Grand Junction. Colorado Mesa University. For info: Hannah Holm, 970/ 683-1133, hholm@mesastate.edu or www.mesastate.edu/WaterCenter

November 1 WEB
Hydraulic Fracturing: Fresh Facts & Critical Choices Webinar, WEB. For info: American Water Resources Ass'n, www.awra.org

November 1-4 Netherlands
Aquatech Amsterdam Trade Show, Amsterdam. For info: Amsterdam RAI, email: info@aquatechtrade.com or website: www.aquatechtrade.com

November 2 WA
Comprehensive Review of Hydropower in the Northwest Seminar, Seattle. Crowne Plaza Hotel. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

November 2-3 CA
San Joaquin River Restoration Tour, Fresno. For info: Water Education Foundation, 916/ 444-6240 or www.watereducation.org

November 2-4 WA
Water in the Columbia Basin: Sharing a Limited Resource Conference, Stevenson. Skamania Lodge. Sponsored by the Pacific NW Water Program. For info: http://conferences.wsu.edu/conferences/columbia/

November 3 CA
Sustainable Planning, Environmental Site Design & Development Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

November 3 CA
Southern California Stormwater Seminar, Los Angeles. Millennium Biltmore Hotel. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

November 3-4 WA
Western Governors' Wildlife Council Meeting, Seattle. For info: Madeleine West, WGA, 303/ 623-9378 x125 or mwest@westgov.org

November 3-4 ID
Idaho Water Users Ass'n Annual Water Law Seminar, Boise. DoubleTree Hotel Riverside. For info: IWUA, 208/ 344-6690 or www.iwua.org/

November 3-4 OR
Oregon Water Law Conference - 20th Annual, Portland. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

November 3-4 OR
5th Annual International Conference on Business & Sustainability, Portland. Portland State University. For info: PSU, http://sba.pdx.edu/sustainabilityconference11/

November 3-8 CA
Innovations in Irrigation Education Conference, San Diego. San Diego Convention Ctr. For info: Irrigation Association, www.irrigationshow.org

November 4 CA
Streambank Assessment & Restoration Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

November 7 CO
The Colorado River Basin: Environmental Perspectives & Action (Speaker Series), Colorado Springs. Colorado College. Bart Miller, Jennifer Pitt & Tom Chart, Speakers. For info: www2.coloradocollege.edu/stateoftherockies/speakerseries.html

November 7-10 NM
2011 AWRA Annual Water Resources Conference, Albuquerque. Hyatt Regency. For info: www.awra.org/meetings/ABQ2011/

November 7-11 OR
2011 Watershed Councils & Conservation Districts Joint Conference, Sunriver. Sunriver Resort. For info: http://councilsdistrictsconference.com/

November 8-9 OR
Business & the Environment: From Risk Management to Competitiveness Conference & Tradeshow, Portland. Red Lion Jantzen Beach. Presented by Northwest Environmental Business Council and ODEQ. For info: Sue Moir, NEBC, 503/ 227-6361, sue@nebc.org or www.nebc.org

November 8-11 CA
66th Annual California Ass'n of Resource Conservation Districts Conference, Stockton. Hilton Stockton. For info: CARCD, 209/ 957-9090

November 9 CA
Regional Planning & Sustainable Communities Strategies: The Road So Far (Course), Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

November 9 CA
Groundwater Law & Hydrology Course, Davis. Da Vinci Bldg., 1632 Da Vinci Court. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

November 9-10 WA
Developing Wind Power in the NW Seminar, Seattle. Washington Convention Ctr. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

November 9-10 GA
American Water Summit 2011, Atlanta. Airport Marriott Gateway. For info: www.acwa.com/events/american-water-summit-2011

November 9-11 OR
2011 Gathering of Watershed Councils, Sunriver. For info: Tom O'Brien, Network of Oregon Watershed Councils, 541/ 682-8365 or http://oregonwatersheds.org

November 12 WA
Washington Water Trust's 6th Annual Benefit Gathering, Woodinville. Willows Lodge. For info: Meghan O'Brien, WWT, 206/ 675-1585 x106 or meghan@washingtonwatertrust.org

The Water Report
Water Rights, Water Quality & Water Solutions in the West
260 N. Polk Street • Eugene, OR 97402

CALENDAR

(continued from previous page)

November 13-17 FL
2011 International Water Conference, Orlando. Hilton in the Walt Disney World Resort. For info: www.eswp.com/water/

November 13-17 AZ
2011 Water Quality Technology Conference & Exposition, Phoenix. Hyatt Regency. Sponsored by American Water Works Ass'n. For info: www.awwa.org/

November 13-17 TX
5th National Conference & Expo on Coastal & Estuarine Habitat Restoration, Galveston. Galveston Island Convention Ctr. For info: www.estuaries.org/conference/

November 14-16 NM
National Tribal Water Quality Conference, Santa Fe. Sponsored by EPA Hdqtrs. For info: Robyn Delehanty, EPA, 202/ 564-3880, delehanty.robyn@epa.gov or http://water.epa.gov/learn/training/tribaltraining/tcourse10_2011.cfm

November 15 CA
Hydraulic Fracking Seminar, Santa Monica. Sheraton Delfina. For info: The Seminar Group, 800/ 574-4852, email: info@theseminargroup.net, or website: www.theseminargroup.net

November 15 AZ
GoGreen '11 Phoenix Conference, Phoenix. Phoenix Convention Ctr. West. For info: http://phoenix.gogreenconference.net/

November 16 IL
Cleaning Up Chicago's Rivers & Waterways Seminar, Chicago. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

November 16-18 AZ
National Water Resources Ass'n Annual Convention, Tucson. Loews Ventana Canyon. For info: NWRA, 703/ 524-1544 or www.nwra.org/

November 17 CO
Hydraulic Fracturing: Core Issues & Trends Workshop, Denver. Grand Hyatt. WEBCAST also. For info: Mark Holland, RMMLF, 303/ 321-8100 x106, mholland@rmmlf.org or www.rmmlf.org

November 17 CA
Sustainable Planning, Environmental Site Design & Development Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

November 22 OR
Conservation Easements/Water Quality & Toxics Seminar, LaGrande. Eastern Oregon University, Hoke 309. Sponsored by Water for Life & Schroeder Law Offices. For info: Helen Moore, WFL, 503/ 375-6003 or helen.moore@waterforlife.net

November 29-Dec. 2 OR
OWRC Annual Meeting, Hood River. Best Western Hood River. For info: Anita Winkler, Oregon Water Resources Congress, 503/363-0121 or www.owrc.org/

November 29-Dec. 2 CA
ACWA 2011 Fall Conference & Exhibition, Anaheim. Marriott Hotel. For info: Ass'n of California Water Agencies, www.acwa.com/content/event-registration

November 29-Dec. 2 NV
2011 NGWA Ground Water Expo & Annual Meeting, Las Vegas. Convention Ctr. Sponsored by National Ground Water Ass'n. For info: http://groundwaterexpo.com or www.ngwa.org

November 30-Dec. 3 CA
Groundwater Resources Management: Adaptation Measures to Water Scarcity - Second UNESCO-UCI 2011 Conference, Irvine. For info: Jean Fried, UC Irvine, jfried@uci.edu

December 1-2 AZ
Western Water Law Conference, Phoenix. Arizona Biltmore Resort. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 1-2 CO
Land Use: What Now? Seminar, Denver. Grand Hyatt. For info: CLE International, 800/ 873-7130 or website: www.cle.com

December 5 CO
The Colorado River Basin & Climate: Perfect Storm for the 21st Century? (Speaker Series), Colorado Springs. Colorado College. Stephen Saunders & Jeff Lukas, Speakers. For info: www2.coloradocollege.edu/stateoftherockies/speakerseries.html

December 5-6 BC
The International Columbia River Seminar, Vancouver. For info: Law Seminars Int'l, 800/ 854-8009, email: registrar@lawseminars.com, or website: www.lawseminars.com

December 7-8 OR
Northwest Environmental Conference & Tradeshow, Portland. Hilton Portland & Executive Tower. For info: NWEC, 503/ 244-4294 x208 or J2www.nwec.org

December 8 CA
Sustainable Planning, Environmental Site Design & Development Course, Sacramento. Sutter Square Galleria, 2901 K Street. For info: UC Davis Extension, 800/ 752-0881 or www.extension.ucdavis.edu/landuse

December 8-9 CO
Water Marketing: The Essentials of Buying & Selling Water Rights Conference, Denver. Grand Hyatt. For info: CLE International, 800/ 873-7130 or website: www.cle.com